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## Ground-Based Midcourse Defense (GMD) Validation of Operational Concept (VOC)



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## Environmental Assessment

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15 March 2002

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The MDA completed the NMD Deployment Environmental Impact Statement in July 2000 to support a future deployment decision. The Secretary of Defense has not yet made a decision to deploy the GMD. However, the need has been identified to gain a higher level of confidence in GMD's capabilities through tests under realistic operational conditions. Validation of the operational concept (VOC) through ground testing of the GMD is a vital part of operationally realistic testing.

The Preferred Alternative analyzed in this GMD VOC Environmental Assessment includes:

1. Construction and operation of a Ground-Based Interceptor (GBI) test site that would include six GBI silos and supporting facilities at Fort Greely, Alaska
2. Battle Management, Command, Control, and Communications (BMC3), which includes the Battle Management, Command and Control (BMC2) communication nodes, the GMD communication network, and the In-Flight Interceptor Communication System Data Terminal as sub-elements at Fort Greely, Alaska
3. Missile Transfer Facility at Eielson Air Force Base (AFB), Alaska
4. Use of the existing COBRA DANE Radar, with upgraded hardware and software, and BMC2 components at Eareckson Air Station
5. Use of the Early Warning Radar to be upgraded and installation of BMC2 Node at Beale AFB, California
6. BMC2 Nodes at Peterson AFB, Shriever AFB, and Cheyenne Mountain, Colorado; and Boeing Facilities in Alabama and California

Clear Air Force Station, Alaska, is being considered as an alternative location to Fort Greely for construction and operation of the GBI test site, associated BMC3, and support facilities.

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## EXECUTIVE SUMMARY

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# EXECUTIVE SUMMARY

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## Introduction

Within the Department of Defense, the Missile Defense Agency (MDA) (formerly the Ballistic Missile Defense Organization) is responsible for developing and testing the Ballistic Missile Defense System. There are three segments currently under development: Boost Phase Defense, Midcourse Defense, and Terminal Defense. An element of the Midcourse Defense Segment is the Ground-Based Midcourse Defense (GMD), formerly known as the National Missile Defense (NMD). The GMD is designed to protect all 50 states of the United States against limited ballistic missile attack by intercepting long-range ballistic missiles during the midcourse (ballistic) phase of their flight, before their reentry into the earth's atmosphere. The MDA completed the NMD Deployment Environmental Impact Statement (EIS) in July 2000 to support a future missile defense deployment decision. Following reviews directed by the Bush Administration, the MDA re-focused the GMD from near-term deployment to an effort to gain a higher level of confidence in GMD's capabilities through operationally realistic testing. This Environmental Assessment (EA) analyzes the potential impacts to the environment of constructing and operating a test bed to validate the GMD operational concept.

The facilities and operations to validate the GMD operational concept and the facilities and operations to improve the realism of GMD interceptor testing are each a part of the Ballistic Missile Defense System Test Bed. Each part of the test bed, however, serves a different test function and has independent utility, purpose, and need as well as different implementation schedules. Consequently, the independent parts of the test bed are being evaluated in separate National Environmental Policy Act analyses. The initial part of the test bed, the GMD validation of operational concept (VOC) analyzed in this EA, is designed to validate potential activities associated with the GMD operational concept by testing the interoperability of the GMD components in a realistic environment. The second type of GMD testing, not analyzed in this EA, would actually involve increasingly robust integrated flight tests in as realistic a mode as possible.

This EA analyzes potential GBI VOC test sites in Alaska and related actions in sites outside Alaska that were identified in the NMD Deployment EIS. This EA incorporates applicable portions of the NMD Deployment EIS by reference. Testing the GMD at a potential operational location would provide the decisionmaker with realistic information on which to assess future decisions.

The deployment concept analyzed in the NMD Deployment EIS was a fixed, land-based, non-nuclear missile defense system with a land and space-based detection system capable of responding to limited strategic ballistic missile threats to the United States. The proposed deployed system would consist of five components: Battle Management, Command, Control, and Communications (BMC3), which includes the Battle Management, Command and Control (BMC2) Node, the GMD communication network, and the In-Flight Interceptor Communication System Data Terminal (IDT) as sub-components; Ground-Based

Interceptor (GBI); X-Band Radar (XBR); Upgraded Early Warning Radar (UEWR); and a space-based detection system.

The NMD Deployment EIS analyzed several deployment location alternatives for the GBI, BMC3, and XBR. The primary location for the majority of the deployment components and support facilities that maximized NMD performance was Alaska. The IDTs and communication network (Defense Satellite Communication System [DSCS] and Fiber Optic Cable [FOC]) were not specifically analyzed in the NMD Deployment EIS due to undefined operational requirements and specific locations, but a general programmatic description of the types of impacts that could be expected from deploying the IDTs was included within the EIS. In addition, since not all sites and requirements for the communications network had been finalized, the exact locations to support and link the components also were excluded from specific analysis in the EIS. However, a general programmatic description of the types of impacts that could be expected was provided in the EIS.

The NMD Deployment EIS described the integration of the entire GBI (rocket boosters and Exoatmospheric Kill Vehicle [EKV]) into a canister (creating a Canisterized Air Vehicle [CAV]) at an integration facility before shipment to the deployment site. Because of a potential change in the interceptor design configuration since the NMD Deployment EIS was published, there are now three revised concepts for integration of the GBI: The GBI may arrive at the GBI test site totally assembled and fueled in the CAV as discussed in the NMD Deployment EIS; the GBI and EKV components may arrive uncanisterized at the GBI test site to be assembled onsite; or the GBI may arrive canisterized with the un-fueled EKV attached requiring the bi-propellant tanks to be installed in a Missile Assembly Building (MAB) or EKV Assembly and Checkout Facility.

### **Proposed Action**

The Proposed Action analyzed in this GMD VOC EA includes construction and operation of a GBI VOC test site at either Fort Greely or Clear Air Force Station (AFS), Alaska containing six GBI silos and supporting facilities, an IDT, a DSCS earth terminal, and an Execution Level BMC2 Node; an IDT and two co-located DSCS earth terminals at Eareckson Air Station (AS), Alaska; and a Missile Transfer Facility at Eielson Air Force Base (AFB), Alaska. The Proposed Action also includes use of the existing COBRA DANE Radar, with upgraded hardware and software, at Eareckson AS; the Early Warning Radar (EWR) to be upgraded at Beale AFB, California; and communications among all facilities analyzed.

This EA evaluates alternative GBI VOC test sites at Fort Greely and Clear AFS, Alaska; several alternative locations for an IDT and DSCS earth terminal at Fort Greely and Clear AFS; alternative IDT and DSCS sites at Eareckson AS; and the alternative FOC routes associated with these sites. No reasonable alternatives to use of the EWR at Beale AFB and the COBRA DANE radar at Eareckson AS were identified.

Proposed activities at Fort Greely, the preferred GBI test site, would include:

- Construction and operation of six GBI silos and support facilities required to support test activities, including a MAB, interceptor storage facilities, and an

EKV Assembly and Checkout Facility; repair and interior modification of existing facilities to house Government and Prime Contractor personnel or administrative mancamp (temporary camp to house administrative personnel); and construction mancamp (temporary camp to house construction personnel)

- Construction and operation of one IDT to support test activities
- Construction and operation of GMD communication network facilities required to support test activities to include one DSCS earth terminal
- Installation and operation of an Execution Level BMC2 Node
- Installation of terrestrial FOC
- Electricity distribution upgrades
- Solid waste landfill extension/construction debris disposal
- Allen Army Airfield runway repairs

Proposed activities at Eareckson AS include:

- Construction and operation of one IDT required for test activities
- Construction and operation of communication network support facilities required to support test activities to include two co-located DSCS earth terminals
- Software and hardware upgrades to the existing COBRA DANE Radar and interior facility modifications to accommodate those hardware upgrades.
- Installation of terrestrial FOC
- Refurbishment of existing Air Force power plant including addition of one 9.5 million liter (2.5 million gallon) previously designed fuel tank
- Establishment of a mancamp if interior modification to existing facilities are not adequate to house the number of personnel involved in the project
- Repair and interior modification of existing facilities for support of construction and operation
- Interior modifications to Building 600 for installation and operation of Element Site Communication BMC2 Node workstations

Proposed activities at Eielson AFB include:

- Construction and operation of a GBI Missile Transfer Facility
- Road modifications such as resurfacing and construction of emergency pull-off ramp

Proposed activities at Beale AFB:

- Interior facility modifications to the existing EWR analyzed in Appendix H of the NMD Deployment EIS
- Upgraded hardware and associated software changes analyzed in Appendix H of the NMD Deployment EIS
- Interior modifications to existing facility for installation and operation of Element Site Communication BMC2 Node workstations

Proposed activities at Peterson AFB, Shriever AFB, and Cheyenne Mountain Complex, Colorado:

- Interior modifications to existing facility for installation and operation of Command Level BMC2 Node workstations

Proposed activities at Boeing Facilities, Alabama and California:

- Interior modifications to existing facilities for installation and operation of Element Site Communication BMC2 Node workstations

Proposed activities at Clear AFS Alternative GBI Site, if selected instead of Fort Greely, would include:

- Construction and operation of six GBI silos and support facilities required to support test activities, including a MAB, interceptor storage facilities, and an EKV Assembly and Checkout Facility, and a mancamp or temporary use of existing facilities to house administrative personnel, construction workers, and operators of the test facilities
- Construction and operation of one IDT to support test activities
- Construction and operation of GMD communication network facilities required to support test activities to include one DSCS earth terminal with one antenna
- Installation of terrestrial FOC
- Installation and operation of an Execution Level BMC2 Node

### **No-action Alternative**

Under the No-action Alternative, the GMD VOC test site would not be established, the GMD and its components could not be tested under operationally realistic conditions, and prove-out of interoperability functions could not be accomplished.

### **Methodology**

To assess the significance of any impact, a list of activities necessary to accomplish the Proposed Action was developed. The affected environment at all applicable locations was then described. Next, those activities with the potential for environmental consequences were identified. The degree of analysis of proposed activities is proportionate to their potential to cause environmental impacts. Many of the locations for the infrastructure and facilities proposed for use in testing the GMD VOC were analyzed in the NMD Deployment EIS and are, in general, smaller scale, or closely related versions of actions at locations identified in the EIS. This EA incorporates by reference much of the analysis in the NMD Deployment EIS. Those activities not addressed in the EIS, or that are significantly different than those analyzed in the EIS, will be analyzed in detail in this EA.

Thirteen broad areas of environmental consideration were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and waste,

health and safety, infrastructure, land use, noise, socioeconomics, water resources, and environmental justice. The areas were analyzed as applicable for each proposed location or activity.

## Results

This section summarizes the conclusions of the analyses made for each of the areas of environmental consideration based on the application of the described methodology. Within each resource summary, only those activities for which a potential environmental concern was determined are described.

**Air Quality**—All areas under consideration are in attainment areas, and as such no General Conformity Applicability Analysis requirements are anticipated for the Proposed Action. Construction and operation emissions would be intermittent and are not anticipated to cause exceedances of air quality standards.

**Airspace**—There are no requirements for additional new restricted airspace. Radiated peak and average power and operating bounds of the UEWR at Beale AFB and the COBRA DANE radar at Eareckson AS would remain the same as current levels.

**Biological Resources**—No threatened or endangered species have been identified at Fort Greely, Eielson AFB, Beale AFB, or Clear AFS. Under the Proposed Action, no impacts would be expected to threatened or endangered species found on or in the vicinity of Eareckson AS. Since Shemya Island is part of the Alaska Maritime National Wildlife Refuge, construction and operation activities would include close coordination with the U.S. Fish and Wildlife Service to identify and incorporate any additional potential mitigations of impacts to biological resources. No federally designated critical habitat has been identified at any of the proposed locations.

Some wetlands would be affected by the project through filling, draining, trenching, and other general construction activities. Wetlands would be avoided at all locations, to the maximum extent practicable in accordance with Executive Order 11990, *Protection of Wetlands*. Since almost all of Shemya contains wetlands, however, some impacts to wetlands are unavoidable. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Permits under Section 404 of the Clean Water Act and state Section 401 water quality certification would be obtained where wetlands would be affected and before any discharge of fill material. Compliance with the required wetland permits guidelines would also help to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations through the public and agency review process. Mitigation measures would be developed during the 404 permitting process with the U.S. Army Corps of Engineers. Agency-recommended mitigations would take into account the size and quality of the wetlands involved.

**Cultural Resources**—Although the COBRA DANE radar at Eareckson AS and the EWR at Beale AFB are considered historically significant Cold War era facilities, only interior modifications are proposed for these two facilities. A Memorandum of Agreement between the U.S. Army and the Alaska State Historic Preservation Officer stipulates that the 26 buildings on Fort Greely eligible for listing on the National Register “may be altered, demolished, leased with no restrictions, or transferred out of federal ownership with no restrictions” following completion of Historic American Buildings Survey (HABS) Level 1 recordation. All HABS information has been delivered. No historically significant facilities would be affected at Eielson AFB or Clear AFS.

If during construction or operation of the proposed facilities cultural items are inadvertently discovered, activities would cease in the immediate area and the State Historic Preservation Officer and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow guidance provided.

**Geology and Soils**—Best Management Practices such as stabilizing fill slopes from erosion and the use of erosion control measures to filter sediment from storm water runoff would be followed to reduce the potential for soil erosion. Construction of facilities would incorporate seismic design parameters consistent with the critical nature of the facilities and their geologic setting. Site design would also avoid construction in permafrost areas to the extent practicable.

**Hazardous Materials and Waste**—Although an increase in hazardous materials use and hazardous waste generation is anticipated, it would be handled and disposed of in accordance with appropriate regulations. During all stages of construction and operation, the Government would look for opportunities to reduce the use of hazardous materials.

**Health and Safety**—Overall there would be a minimal increase in health and safety risk from construction and operation of a GBI VOC test site. The construction of new facilities is routinely accomplished for both military and civilian operations and presents only occupational-related effects on the safety and health of workers involved in the performance of construction activity. Facility and equipment design would incorporate measures to minimize the potential for and impact of accidents. The potential for a mishap during handling of a GBI or fueling of an EKV is small due to safety precautions that would be in place. Specific health and safety plans would be developed including evacuation plans, and notification of local and offsite emergency response as required. An emergency response team would be on call during bi-propellant EKV tank installation. The local fire departments would be notified through the existing cooperative agreements with the installation. Electromagnetic radiation levels would not exceed established personnel exposure limits.

**Infrastructure**—The electrical power distribution system on Fort Greely, if selected, would need to be expanded to support the proposed GBI VOC test site. Implementation of the Proposed Action would not result in impacts to existing electrical service to Fort Greely. The solid waste disposal system on Fort Greely, if selected, would also need to be upgraded or expanded to support the GBI VOC test site. All current infrastructure systems at other proposed locations have adequate capacity to support anticipated demands.

**Land Use**—Construction and operation of the GBI VOC test site and related support facilities would be compatible with regional and local planning/zoning and surrounding on and off base land uses.

**Noise**—No noise sensitive receptors (e.g., churches, schools, residential communities, etc.) have been identified in the vicinity of the proposed construction sites. Construction noise would be short-term and would not constitute a health risk. No long-term impacts are anticipated.

**Socioeconomics**—It is anticipated that construction and operation of the proposed GBI VOC test site would result in an economic benefit to the installation and surrounding region.

**Water Resources**—A minor potential exists for short-term increases to sediment in surface water during construction. Storm water permit provisions and storm water plans would be implemented to minimize these potential impacts. Best Management Practices such as stabilizing fill slopes from erosion and the use of erosion control measures to filter sediment from storm water runoff would be implemented. For Clear AFS, due to the shallow water table, dewatering of the site during silo construction and/or operation would require authorization under a state-wide general permit.

**Environmental Justice**—No low-income or minority populations would be disproportionately affected.

**Cumulative Impacts**—GMD VOC Test Bed activities are proposed for a number of widely separated geographic areas. Consequently, there is little or no potential for significant cumulative impacts between the various Test Bed sites. Nor are any significant cumulative environmental impacts foreseen at Beale AFB, California or at any of the BMC2 sites in the Continental United States, since activities at these sites involve primarily interior modifications to existing facilities.

There may be some temporary minor cumulative impacts to air quality at sites in Alaska during construction activities. Similarly, there would be a minor cumulative increase in the use of hazardous materials, generation of hazardous waste, and demand on infrastructure and utility systems during the construction phase. There would be no long-term significant cumulative impacts to soils or water quality, since disturbed areas would be restored after construction was completed. There would be a net loss of about 1 percent of the wetlands at Shemya Island, and there is also the potential for a net loss of 1 to 12 percent of the wetlands at Clear AFS if it is selected as the GBI VOC site. Some cumulative beneficial impacts on local economies in the vicinity of construction activities and from operation of GMD VOC Test Bed sites would be expected. There is the potential for an increase in fire and safety risk from operation of a Missile Transfer Facility at Eielson AFB. However, the risk would be minimized by observing explosive safety zones and procedures.

Table ES-1: Summary of Environmental Impacts

Resource Category	Fort Greely	Clear AFS	Eareckson AS	Eielson AFB	Beale AFB	Delta Junction	No-action
Air Quality	Temporary localized increase in air emissions from construction and minor emission levels from operation would not affect the region's current attainment status	Temporary localized increase in air emissions from construction and minor emission levels from operation would not affect the region's current attainment status	Temporary localized increase in air emissions from construction. No change to the region's current attainment status	Temporary localized increase in air emissions from construction. No change to the region's current attainment status	No change to the region's current attainment status	Temporary localized increase in air emissions from construction of mancamp. No change to the region's current attainment status	No change to the region's current attainment status
Airspace	No impact	No impact	No change in airspace status or use	No impact	No change in airspace status or use	No impact	No impact
Biological Resources	Short-term noise-related impacts to wildlife during construction. Minimal impacts are expected to vegetation and wildlife; no threatened or endangered species have been identified; no direct impacts to wetlands	Short-term noise-related impacts to wildlife during construction. Minimal impacts are expected to vegetation and wildlife; no threatened or endangered species have been identified. The potential exists to impact between 2.7 hectares (6.6 acres) and 55 hectares (135 acres) of wetlands depending on location selected (1 to 12 percent)	Short-term noise-related impacts to wildlife during construction. Minimal impacts are expected to vegetation and wildlife, including the threatened and endangered species found on and in the water surrounding Shemya Island. No impacts to biological resources from proposed GMD-related radar operations. The potential exists to impact up to 7 hectares (17 acres) of wetlands, less than 1 percent of the wetlands on the island	Short-term noise-related impacts to wildlife during construction; continued minimal impacts to wildlife from aircraft activities; no impacts to biological resources from proposed road modifications associated with the Missile Transfer Facility. No threatened or endangered species have been identified	No impacts to biological resources including threatened or endangered species from GMD-related radar operations	Short-term noise-related impacts to wildlife during construction. Minimal impacts are expected to vegetation and wildlife. No threatened or endangered species have been identified	Fort Greely: Continued minor impacts to vegetation and wildlife from current training activities
Cultural Resources	No impacts to identified cultural resources since applicable HABS documentation has been completed	No impact since no historic or traditional properties have been identified within the area proposed for use	No impact to historically significant Cold War era facilities (COBRA DANE Radar); only interior modifications are proposed	No impact to cultural resources since area proposed for use is previously disturbed and already leveled and graveled	No impact to historically significant Cold War era facilities (EWR); only interior modifications are proposed	No impact anticipated to cultural resources	No impacts, resources would continue to be managed in accordance with cultural resource regulations
Geology and Soils	Minor localized soil erosion during construction. No impacts to permafrost expected	Minor localized soil erosion during construction. No impacts to permafrost expected	Minor localized soil erosion during construction. No impacts to permafrost expected	Minor localized soil erosion during construction. No impacts to permafrost expected	No impact	Minor localized soil erosion during construction. No impacts to permafrost expected	No impact
Hazardous Materials and Hazardous Waste Management	Slight increase in amount of hazardous material used and hazardous waste generated	Slight increase in amount of hazardous material used and hazardous waste generated	Slight increase in amount of hazardous material used and hazardous waste generated	Slight increase in amount of hazardous material used and hazardous waste generated	No impact	No impact	Continued use of hazardous materials and generation of hazardous waste

**Table ES-1: Summary of Environmental Impacts (Continued)**

Resource Category	Fort Greely	Clear AFS	Eareckson AS	Eielson AFB	Beale AFB	Delta Junction	No-action
<b>Health and Safety</b>	Minimal increase in health and safety risks during construction and operation	Minimal increase in health and safety risks during construction and operation	Minimal increase in health and safety risks during construction and operation	Minimal increase in health and safety risks during construction and operation	No impact	Minimal increase in health and safety risks during construction	No impact
<b>Infrastructure</b>	New wells, upgraded electrical transmission lines, and expanded or new solid waste landfill would handle the increase in demand for these services	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand; power plant upgrades would increase reliability of the system	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	No impact
<b>Land Use</b>	No impact	No impact	No impact	No impact	No impact	No impacts anticipated	No impact
<b>Noise</b>	No impact	No impact	No impact	No impact	No impact	No impact	No impact
<b>Socioeconomics</b>	Positive economic impact from increase in jobs associated with proposed action	Positive economic impact from increase in jobs associated with proposed action	No impact	No impact	No impact	Positive economic impact from increase in jobs associated with Proposed Action	No impact
<b>Water Resources</b>	Minor potential for short-term increase in sediment in surface water during construction	Minor potential for short-term increase in sediment in surface water during construction. Potential for long-term dewatering of GBI silo field	Minor potential for short-term increase in sediment in surface water during construction	Minor potential for short-term increase in sediment in surface water during construction	No impact	Minor potential for short-term increase in sediment in surface water during construction	Fort Greely: Continued potential for impacts to water resources from military training activities
<b>Environmental Justice</b>	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected

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## **ACRONYMS AND ABBREVIATIONS**

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# ACRONYMS AND ABBREVIATIONS

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AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
ANSI	American National Standards Institute
AFS	Air Force Station
AS	Air Station
AST	aboveground storage tank
AWCRSA	Aleutians West Coastal Resource Service Area
BMC2	Battle Management, Command and Control
BMC3	Battle Management, Command, Control, and Communications
BMP	Best Management Practices
CAV	Canisterized Air Vehicle
CDP	Census Designated Place
CFR	Code of Federal Regulations
dB	decibel
dBA	decibel, A-weighted
DNL (L <sub>dn</sub> )	A-weighted Day-Night Equivalent Sound Level
DoD	Department of Defense
DSCS	Defense Satellite Communication System
EA	environmental assessment
EIS	environmental impact statement
EKV	Exoatmospheric Kill Vehicle
EPA	Environmental Protection Agency
ESQD	Explosive Safety Quantity-Distance
EMR	electromagnetic Radiation
EWR	Early Warning Radar
FAA	Federal Aviation Administration
FOC	Fiber Optic Cable
GBI	Ground-Based Interceptor
GCN	Ground-Based Midcourse Defense Communication Network
GMD	Ground-Based Midcourse Defense

HABS	Historic American Buildings Survey
HAER	Historic American Engineering Report
ICAO	International Civil Aviation Organization
IDT	In-Flight Interceptor Communication System Data Terminal
IRP	Installation Restoration Program
kVA	kilovolt-ampere
kW	kilowatt
$L_{eq}$	Continuous Equivalent Sound Level
MAB	Missile Assembly Building
MDA	Missile Defense Agency
MHz	megahertz
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMD	National Missile Defense
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PAWS	Phased Array Warning System
PCB	polychlorinated biphenyl
PM-10	particulate matter of 10 microns in diameter or smaller
ppm	parts per million
PSD	Prevention of Significant Deterioration
RF	radio frequency
ROI	region of influence
SHPO	State Historic Preservation Officer
SWPPP	Storm Water Pollution Prevention Plan
UEWR	Upgraded Early Warning Radars
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	Validation of Operational Concept
VHF	very high frequency
XBR	X-Band Radar

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# **1.0**

## **PURPOSE AND NEED**

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# **1.0 PURPOSE AND NEED**

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## **1.1 INTRODUCTION**

The National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, Department of Defense (DoD) Instruction 4715.9, and the applicable service environmental regulations that implement these laws and regulations direct DoD officials to consider environmental consequences when authorizing and approving Federal actions. Accordingly; this environmental assessment (EA) examines the potential for impacts to the environment as a result of proposed Ground-Based Midcourse Defense (GMD) Validation of Operational Concept (VOC) activities.

## **1.2 BACKGROUND**

Within the DoD, the Missile Defense Agency (MDA) (formerly the Ballistic Missile Defense Organization) is responsible for developing and testing the Ballistic Missile Defense System. There are three segments of this system currently under development: Boost Phase Defense, Midcourse Defense, and Terminal Defense. An element of the Midcourse Defense Segment is the GMD, formerly known as the National Missile Defense (NMD). The GMD Joint Program Office, within MDA, is responsible for the GMD, which is designed to intercept long-range ballistic missiles during the midcourse (ballistic) phase of their flight, before their reentry into the earth's atmosphere. The MDA completed the NMD Deployment Environmental Impact Statement (EIS) in July 2000 to support a future deployment decision.

The deployment concept analyzed in the NMD Deployment EIS was a fixed, land-based, non-nuclear missile defense system with a land- and space-based detection system capable of responding to limited strategic ballistic missile threats to the United States. The proposed deployed system would consist of five components: Battle Management, Command, Control, and Communications (BMC3), which includes the Battle Management, Command and Control (BMC2) Node, the GMD communication network (GCN), and the In-Flight Interceptor Communication System Data Terminal (IDT) as sub-components; Ground-Based Interceptor (GBI); X-Band Radar (XBR); Upgraded Early Warning Radar (UEWR); and a space-based detection system. Depending on the capability available if or when a deployment decision is made, the space-based detection capability would be the existing Defense Support Program early-warning satellites and/or Space-Based Infrared System satellites, currently being developed by MDA.

The NMD Deployment EIS analyzed several deployment location alternatives for the GBI, BMC3, and XBR. The primary location for the majority of the deployment elements and support facilities that maximized NMD performance was Alaska. North Dakota was also considered as a potential deployment location. The IDTs and communication network were not specifically analyzed in the NMD Deployment EIS because of undefined operational

requirements and specific locations. However, the NMD Deployment EIS included a general programmatic description of the types of impacts that could be expected from deploying these elements. The IDT regions studied included Alaska and North Dakota. The NMD Deployment EIS indicated that once the specific locations and requirements of the IDTs and communication network were identified, supplemental site-specific analysis would be performed based on the initial programmatic analysis in the EIS.

Following reviews directed by the Bush Administration, the MDA re-focused the GMD from near-term deployment to an effort that would provide operationally realistic testing. Fort Greely is a potential location in Alaska for GBI silos, BMC3 facilities, and other supporting facilities if there were a decision to deploy GMD, and thus Fort Greely is a suitable test location to validate the GMD operational concept. The DoD determined that it was prudent planning to proceed with site preparation activities at Fort Greely to preserve the near-term option to develop a GMD VOC test site. The MDA issued a Record of Decision based on analysis in the NMD Deployment EIS to conduct initial site preparation activities for the Fort Greely portion of a GMD test site.

The initial test site preparation activities in the Record of Decision included site layout, clearing of vegetation, initial earthwork related to site and road grading, and preparation for facility construction activities at Fort Greely involving disturbance to approximately 54 hectares (134 acres). Specific actions included installing and developing two water wells and site preparation work for test bed buildings, the main access road up to the Alaska Oil Pipeline crossing, and a single missile field. This decision did not include construction and operation of a GMD VOC test site at Fort Greely. These initial site preparation activities were considered not to be of sufficient magnitude to limit any later selection of the alternatives analyzed in the NMD Deployment EIS.

The facilities and operations to validate the GMD operational concept and the facilities and operations to improve the realism of GMD interceptor testing are each a part of the Ballistic Missile Defense System Test Bed. Each part of the test bed, however, serves a different test function and has independent utility, purpose, and need. The independent parts of the test bed also have different implementation schedules. Consequently, the independent parts of the test bed are being evaluated in separate NEPA analyses. The GMD testing would be of two types. The first, validation of the operational concept analyzed in this EA, is designed to validate potential activities associated with the GMD operational concept by testing the interoperability of the GMD components in a realistic environment. Activities that will assist in the validation of the GMD operational concept include construction techniques, operational procedures, installation, checkout, assembly, and maintenance. These activities would produce significantly enhanced realistic BMC3 tests conducted from existing facilities. They would also provide vital validation of the operational concept through distributed integrated ground tests using GMD components located in operationally representative locations and environments even if the more robust integrated flight testing along more realistic and multiple trajectories never occur.

The second type of GMD testing, not analyzed in this EA, would involve increasingly robust interceptor flight tests in as realistic a mode as possible. The more robust interceptor testing will be analyzed in a GMD Extended Test Range EIS that is in the initial

stages of preparation. Because the GMD Extended Test Range EIS scope and alternatives are still being refined, these proposed flight tests may include the following, among other possible tests, as a second independent part of the Ballistic Missile Defense System Test Bed:

- Interceptor and target launches from Kodiak, Alaska
- Existing ship-borne sensors
- Interceptor launches from the Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll, Republic of the Marshall Islands
- Mobile target launches over the Pacific Ocean
- Interceptor and target launches from Vandenberg Air Force Base (AFB), California
- Land-based radars in southern Alaska
- IDT and commercial satellite communications facilities in the mid-Pacific, and at Kodiak Launch Complex or Vandenberg AFB

The extension of the test range would improve the realism of the GMD interception testing by allowing test and evaluation of GMD element components in a geographically dispersed operational environment and testing of multiple engagements from a variety of trajectories and distances at increased speeds. This would reduce the artificialities in the present GMD test process. The extended test range would meaningfully contribute to the development of an effective GMD, even if the initial validation of the GMD operational concept phase of the test bed were never constructed.

In addition, MDA may determine that more robust, operationally realistic GMD testing requires a test XBR located somewhere in the Pacific. A new test XBR could allow the discontinuation of the use of a C-band transmitter beacon on targets tracked by the C-band radar located at Kaena Point, Oahu, Hawaii. The use of the C-band has been identified as one of the artificialities of the present GMD testing program. MDA is still determining what requirements a test XBR should be required to perform, whether it should be located on land or on a mobile sea based platform, and the priority of funding a test XBR. Because of these uncertainties, and the preliminary stages of analysis, a test XBR is not yet ready for NEPA analysis. If MDA determines a new test XBR in the Pacific is a test priority and determines a preferred alternative for a test XBR, it will perform a separate NEPA analysis. The more robust operationally representative integrated flight testing to be performed and evaluated in the GMD Extended Test Range EIS has independent utility and will meaningfully contribute to MDA testing, even if a test XBR is never constructed. Conversely, a test XBR would have independent utility and would meaningfully contribute to the operational realism of MDA testing, even if the GMD test range were not expanded for increased interceptor and target launches.

Independent, installation specific NEPA analysis is also planned for potential silo refurbishment on Meck Island in the mid Pacific and Vandenberg AFB, California. This

planned work would support the present GMD testing program, and would be of significant utility, even if the GMD test range were not expanded for increased interceptor and target launches. The silo refurbishment analyses will be incorporated into the GMD Extended Test Range EIS as part of the cumulative impacts discussion because the proposed actions are at or near the same geographic locations.

The Preferred Alternative analyzed in this GMD VOC EA includes construction and operation of six GBI silos and supporting facilities at Fort Greely, Alaska; IDTs and Defense Satellite Communication System (DSCS) earth terminals at Fort Greely and Eareckson Air Station (AS), Alaska; and a Missile Transfer Facility at Eielson AFB, Alaska. The Preferred Alternative also includes use of the existing COBRA DANE Radar, with upgraded hardware and software, at Eareckson AS; the Early Warning Radar (EWR) to be upgraded at Beale AFB, California; and communications among all facilities analyzed. Clear Air Force Station (AFS), Alaska, is being considered as an alternative location to Fort Greely for GBI silos, associated BMC3, and support facilities. Several locations are being considered for BMC2 Nodes. These locations include Peterson AFB, Shriever AFB, and Cheyenne Mountain Complex, Colorado, the Boeing Facilities in California and Alabama, Beale AFB, and Eareckson AS. A BMC2 Node would also be located at the selected GBI VOC test site.

Although MDA is considering conducting one or two checkout flights at a GBI test site at some future time, this possibility is still at a rudimentary stage of consideration and too speculative to be meaningfully analyzed at this time. The checkout flights would validate the proper operation of the silo configuration and the command, control, and communication network of the GMD. The U.S. Government does not customarily conduct missile tests over populated areas, due to the safety risks to the public. For example, the United States did not conduct checkout flights of the Minuteman missiles deployed in North Dakota and the Midwest during the 1960s. If potential trajectory analysis, population surveys, and possible acquisition of easements determine that a missile checkout from the GBI VOC test site would be safe, reasonable, and of value to the Ballistic Missile Defense System, then an analysis would be conducted pursuant to NEPA. MDA is still in the preliminary stages of considering the feasibility and value of a checkout flight from the GBI VOC test site. The GBI VOC test site and supporting structures would meaningfully contribute to the operational realism of GMD testing, even if no checkout flights were ever conducted.

### **1.3 PURPOSE AND NEED**

The proliferation of weapons of mass destruction and technology of long-range missiles is increasing the threat to our national security. The purpose of the GMD is to defend all 50 states of the United States against limited ballistic missile attack. The Bush Administration has not yet made a decision to deploy the GMD. However, the Secretary of Defense has identified the need to gain a higher level of confidence in GMD's capabilities through tests under realistic operational conditions. Validating the operational concept through ground testing at locations at which the GMD could reasonably be expected to be deployed, if such a limited defense were deployed, is a vital part of this realistic testing.

The purpose of this EA is to evaluate the potential environmental impacts of activities designed to validate the operational concept of a GMD that could effectively protect all 50 states from a limited ballistic missile attack. This EA analyzes potential GBI VOC test sites in Alaska that were identified as reasonable alternatives for maximizing NMD performance in the NMD Deployment EIS and which remain reasonable GMD alternatives. Testing the GMD in one of the preferred deployment locations would provide the decisionmaker with realistic information on which to assess a future deployment decision.

## **1.4 DECISION(S) TO BE MADE**

The decision to be made is whether to construct and operate the GMD test facilities, infrastructure, and communication links that would enable MDA to validate the GMD operational concept. This analysis could also support U.S. Army and U.S. Air Force decisions concerning implementation of the Proposed Action.

## **1.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT**

This analysis is tiered from the *Ballistic Missile Defense Final Programmatic Environmental Impact Statement* (Ballistic Missile Defense Organization, 1994), which evaluated NMD, now GMD, programmatic activities, such as research and development, testing, production, and the general operational concept. A Finding of No Significant Impact will be prepared and attached to the Final GMD VOC EA, or a Notice of Intent to produce an EIS will be published.

Many of the locations for the infrastructure and facilities proposed for use as a test bed to validate the GMD operational concept were analyzed in the NMD Deployment EIS and are, in general, smaller scale, or closely related versions of actions at locations identified in the EIS. Validation of the GMD operational concept through operationally realistic testing of selected components is integral to accomplishing future deployment of the GMD. This EA will incorporate by reference much of the analysis in the NMD Deployment EIS. Those activities not addressed in the EIS, or that are significantly different than those analyzed in the EIS, will be analyzed in detail in this EA. The EA analyzes the potential environmental impacts of construction and operation activities associated with validation of the GMD operational concept.

The NMD Deployment EIS analyzed Fort Greely, Clear AFS, and the Yukon Training area as reasonable alternatives for a deployed GBI in Alaska. According to the NMD Deployment EIS, the Yukon training area is incompatible with the NMD, now GMD, action due to mission conflicts. Consequently, only Fort Greely and Clear AFS remain reasonable alternatives for a deployed GMD that could effectively defend all 50 states from a limited ballistic missile attack.

Proposed BMC2 activities at Peterson AFB, Shriever AFB, and Cheyenne Mountain Complex, Colorado, the Boeing Facilities in California and Alabama, Beale AFB, and Eareckson AS would consist of placing computer and communication equipment within an existing room, which may require minor interior modifications; therefore, no affected environment is presented. Appropriate health and safety and hazardous materials and waste management regulations would be followed during any modifications; therefore, no impacts are anticipated. The locations are listed below for completeness, but are not addressed further. The Execution Level BMC2 Node at Fort Greely or Clear AFS would be installed in a new Readiness and Control Station discussed under the GBI test site construction.

Construction of test facilities would begin in Spring 2002, and operations would begin no earlier than Spring 2004. The GMD test activities and proposed locations are summarized below.

### **1.5.1 PREFERRED GBI SITE, FORT GREELY, ALASKA**

- Construction and operation of six GBI silos and facilities required to support test activities, including a Missile Assembly Building (MAB); repair and interior modification of existing facilities to house Government and Prime Contractor personnel or an administrative mancamp; and construction mancamp off site.
- Construction and operation of one IDT to support test activities
- Construction and operation of GCN facilities required to support test activities including one DSCS earth terminal
- Installation and operation of an Execution Level BMC2 Node (including an ability to support conduct of integrated flight tests as is currently accomplished from the Reagan Test Site at Kwajalein Atoll)
- Installation of terrestrial Fiber Optic Cable (FOC)
- Upgrade of electricity distribution
- Extension of the solid waste landfill
- Establishment of a construction debris landfill and landfill access road
- Repairs to the Allen Army Airfield runway

#### **Eareckson AS, Shemya, Alaska**

- Construction and operation of one IDT required to support test activities
- Construction and operation of GCN facilities required to support test activities including two co-located DSCS earth terminals
- Upgrades to software and hardware of the existing COBRA DANE Radar and modifications to the interior of the facility to accommodate the hardware
- Installation of terrestrial FOC
- Refurbishment of existing power plant including addition of one 9.5-million-liter (2.5-million-gallon) previously designed fuel tank

- Establishment of mancamps if interior modifications to existing facilities are not adequate to house the number of personnel involved in the project
- Repair and interior modification of existing facilities for support of construction and operation
- Facility modifications to Building 600 and operation of Element Site Communication BMC2 Node workstations

#### **Beale AFB, California**

- Upgraded hardware and associated software changes analyzed in Appendix H of the NMD Deployment EIS
- Interior facility modifications to the existing EWR to accommodate the hardware changes analyzed in Appendix H of the NMD Deployment EIS
- Interior modifications to existing facility for installation and operation of Element Site Communication BMC2 Node workstations

#### **Eielson AFB, Alaska**

- Construction and operation of a GBI Missile Transfer Facility
- Road modifications such as resurfacing and construction of an emergency pull-off ramp

#### **Peterson AFB, Colorado**

- Interior modifications to existing facility for installation and operation of Command Level BMC2 Node workstations

#### **Shriever AFB, Colorado**

- Interior modifications to existing facility for installation and operation of Command Level BMC2 Node workstations

#### **Cheyenne Mountain Complex, Colorado**

- Interior modifications to existing facility for installation and operation of Command Level BMC2 Node workstations

#### **Boeing Facility, Anaheim, California**

- Interior modifications to existing facility for installation and operation of Element Site Communication BMC2 Node workstations

#### **Boeing Facility, Huntsville, Alabama**

- Interior modifications to existing facility for installation and operation of Element Site Communication BMC2 Node workstations

### 1.5.2 ALTERNATIVE GBI SITE, CLEAR AFS, ALASKA

- Construction and operation of six GBI silos and facilities required to support test activities, including mancamps and temporary use of existing facilities to house construction workers and operators of the test facilities
- Construction and operation of one IDT and facilities to support test activities
- Construction and operation of GCN facilities required to support test activities to include one DSCS earth terminal
- Installation and operation of an Execution Level BMC2 Node
- Installation of terrestrial FOC

Facilities at other sites would be the same as for the Preferred Alternative.

## 1.6 RELATED DOCUMENTATION

Ballistic Missile Defense Organization, 1994. *Ballistic Missile Defense Final Programmatic Environmental Impact Statement*.

Department of Defense, 1999. *Integration, Assembly, Test, and Checkout of National Missile Defense Components at Redstone Arsenal, Alabama Environmental Assessment*, February.

Department of Defense, 2000. *National Missile Defense Exoatmospheric Kill Vehicle Final Assembly and Checkout Operations at Redstone Arsenal, Alabama Environmental Assessment*, March.

Department of Defense, 2000. *National Missile Defense Deployment Environmental Impact Statement*, July.

Contact the U.S. Army Space and Missile Defense Command, SMDC-EN-V, PO Box 1500, Huntsville, AL 35807-3801 for information on obtaining documents incorporated by reference.

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## **2.0**

# **DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

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## **2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

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### **2.1 PROPOSED ACTION**

#### **GMD VOC Test Site Overview**

The GMD VOC activities would be used to prove construction techniques for GMD components and validate the operational concept of GMD. Figure 2-1 graphically depicts the potential GMD test locations and site components. The activities and functions to be tested and verified during construction and operations include construction techniques, procedures, and methods, component installation and checkout, component assembly, maintenance in a realistic environment, and the ability to effectively command, control, and communicate among test components.

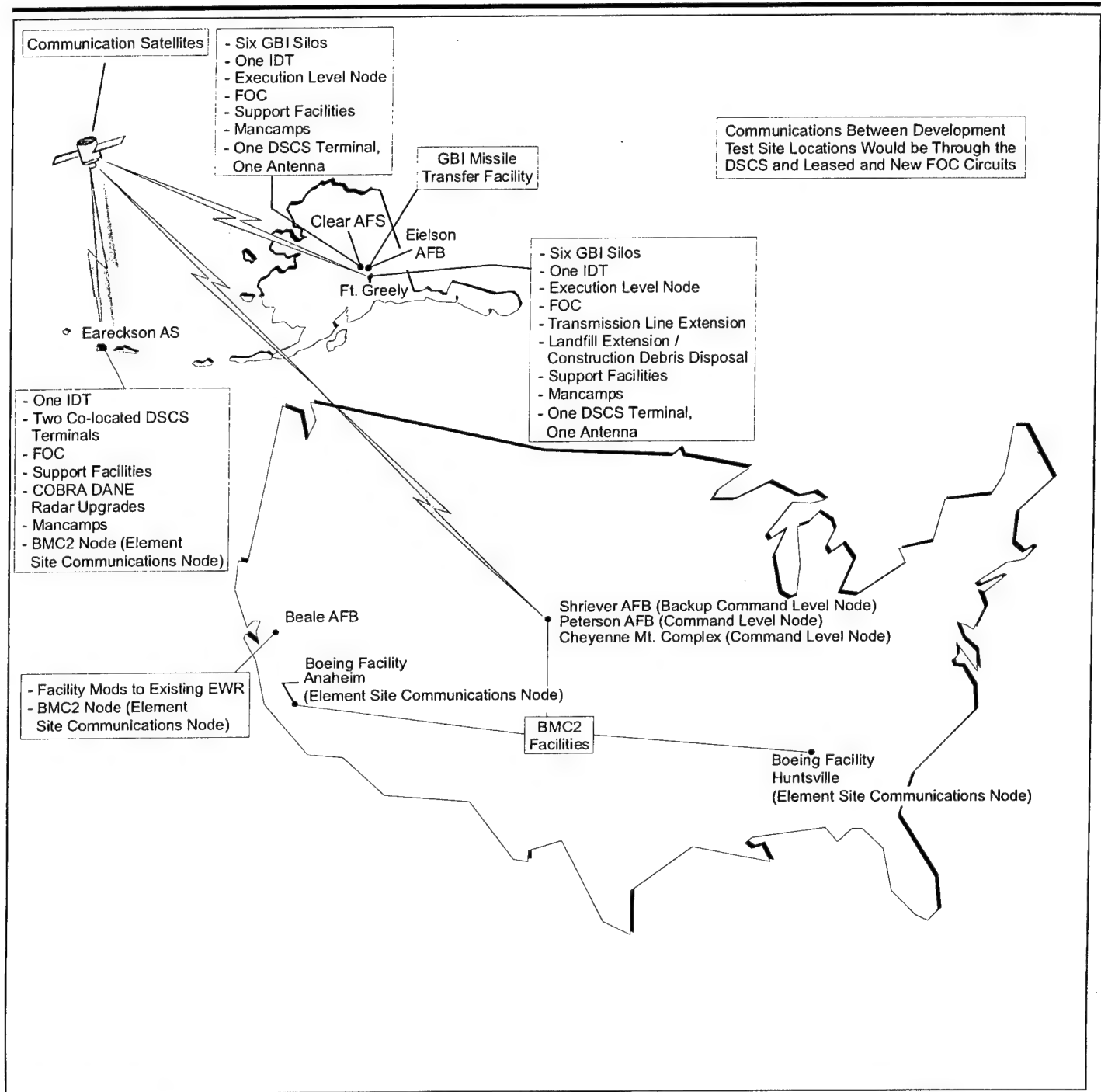
### **2.2 GMD VOC TEST SITE COMPONENTS**

#### **2.2.1 GROUND-BASED INTERCEPTOR**

As described in the NMD Deployment Final EIS (Department of Defense, 2000), the mission of the GBI is to intercept incoming ballistic missile warheads outside the earth's atmosphere and destroy them by force of impact. The GBI missile has two main components: the Exoatmospheric Kill Vehicle (EKV) and a booster. No explosives or nuclear warheads would be used. The GBI VOC test site would include six silos, MAB, interceptor storage facilities, EKV Assembly and Checkout Facility, and associated support equipment, facilities, and personnel.

The amount of propellant could be more per interceptor than that analyzed in the NMD Deployment EIS, but the total propellant amount for the test activities would be much less than that contained in the 100 missiles analyzed in the NMD Deployment EIS. Each EKV would contain less than 19 liters (5 gallons) of liquid hypergolic propellants, the same amount and type of liquid propellant (hydrazine and nitrogen tetroxide) as that described and analyzed in the NMD Deployment EIS.

The NMD Deployment EIS described the integration of the entire GBI (rocket boosters and EKV) into a canister (creating a Canisterized Air Vehicle [CAV]) at an integration facility before shipment to the deployment site. Because of a potential change in the interceptor design configuration since the NMD Deployment EIS was published, there are now three revised concepts for integration of the GBI: (1) The GBI may arrive at the GBI field totally assembled and fueled in the CAV as discussed in the NMD Deployment EIS; (2) the GBI and EKV components may arrive uncanisterized at the GBI field to be assembled on site; or (3) the GBI may arrive canisterized with the un-fueled EKV attached requiring the



## EXPLANATION

- BMC2 - Battle Management Command & Control  
 DSCS - Defense Satellite Communication System  
 EWR - Early Warning Radar  
 FOC - Fiber Optic Cable  
 GBI - Ground-based Interceptor  
 IDT - In-Flight Interceptor Communication System Data Terminal  
 — DSCS Communications

## Potential GMD Test Locations and Site Elements

Figure 2-1



Not to Scale

bi-propellant (fuel and oxidizer) tanks to be installed in the MAB or EKV Assembly and Checkout Facility.

This EA incorporates the analysis of the NMD Deployment EIS as it applies to the CAV, and will analyze the potential impacts associated with an interceptor that would need to be partially or wholly assembled on site.

The interceptor boosters and unfueled EKV would be transported by air to the GBI VOC test site if an adequate runway is available at the site, then transported to the military installation by truck to the MAB and EKV Assembly and Checkout Facility. If no adequate runway is available at the GBI VOC test site the interceptor boosters and unfueled EKV would be transported by air to Eielson AFB. The interceptor boosters and components may be temporarily stored in a proposed Missile Transfer Facility at Eielson AFB (see section 2.2.5) before being trucked to the GBI VOC test site.

If a runway is not available (due to weather, etc.), transportation would be by an alternate approach of sea and land. The EKV bi-propellant tanks and large GBI related items (e.g., silos and silo liners) could be barged to Valdez, Alaska then transported over land by truck, transported from the manufacturer by truck, or shipped by rail; however, the shipping method has not been determined. The bi-propellant tanks would be stored in the EKV Fuel and Oxidizer Storage facilities until mounted onto the EKV subassembly. GBI components, sub-components and all fuels would be transported in accordance with U.S. Department of Transportation, U.S. Air Force, and U.S. Army regulations.

### **Construction**

The GBI VOC test site would contain the GBI silos, a MAB, three Interceptor Storage Facilities, an EKV Assembly and Checkout Facility, EKV fuel and oxidizer storage facilities, and additional support facilities. Construction would require up to 162 hectares (400 acres). Table 2-1 provides an overview of the GBI facility requirements. The final facilities designs, interceptor configuration, and layout of the test site have not yet been completed. Because of this, some slight changes to the final facility requirements and site layout are possible. Changes of this nature, however, are unlikely to result in meaningful differences in potential environmental impacts. Final plans will be reviewed and compared to this EA prior to issuing a notice to proceed with construction work.

Six silos would be constructed at the GBI VOC test site. Five silos would be used for static ground testing. The sixth silo would be used for testing and training that could not be performed on a missile with live ordnance. The sixth silo would also provide a location for evaluation of modifications or upgrades to the silo design during the development and testing process, without disrupting ongoing tests in the other five silos containing GBIs. If a decision were made to incorporate the design modifications or changes, the sixth silo would accommodate the work without disturbing the other five. A GBI could then be moved from one of the other five silos into the new modified silo. The newly emptied silo could then be modified and tested and then the process would continue until the remaining silos are upgraded and the GBIs re-loaded. The sixth silo would also be used if one of the other five silos is inadvertently damaged and in need of repair. The GBI in the damaged

silo would be moved into this spare silo until necessary repairs are completed. Although some handling of the missiles in the silos is necessary, the sixth silo would minimize unnecessary handling in the other five silos.

**Table 2-1: GBI New Facility Requirements**

Facility	Facility Requirements <sup>(1)</sup>	Facility Activities
Missile Silos <sup>(2)</sup>	6 silos	GBI placement area
Missile Assembly Building	1,207 square meters (13,000 square feet);	Interceptor component receiving, assembly, and checkout area
Interceptor Storage Facilities <sup>(2)</sup>	3 structures at 418 square meters (4,500 square feet) each	Provide storage for GBI and parts
EKV Assembly and Checkout Facilities	836 square meters (9,000 square feet)	EKV receiving, assembly, and checkout area
EKV Fuel/Oxidizer Storage Facilities	2 structures at 88 square meters (950 square feet) each	Provide storage for EKV hypergolic fuel and oxidizer
Entry Control Station <sup>(2)</sup>	372 square meters (4,000 square feet)	Security entry point
Readiness and Control Station <sup>(2)</sup>	2,323 square meters (25,000 square feet)	Operational center for GBI complex, includes a BMC2 Execution Level Node
Mechanical/Electrical Building <sup>(2)</sup>	1,115 square meters (12,000 square feet)	Provide a blast-resistant enclosure space for mechanical and electrical support systems
Electrical Substation <sup>(2)</sup>	139 square meters (1,500 square feet)	Provide site electrical power
Utility Building	316 square meters (3,400 square feet)	House switchgear and provide heated water
Water Supply Building <sup>(2)</sup>	279 square meters (3,000 square feet)	Provide site water supply
Fuel Storage Area	2 aboveground storage tanks at 113,562 liters (30,000 gallons) each	Provide storage for boiler and backup power generator diesel fuel
Fuel Unloading Area <sup>(2)</sup>	46 square meters (500 square feet)	Provide safe fuel unloading area outside explosive safety zones

<sup>(1)</sup> Facility size is approximate. Facilities will be separated in accordance with DoD requirements.

<sup>(2)</sup> GBI facilities analyzed in the NMD Deployment EIS

The NMD Deployment EIS described and analyzed many of the GBI facilities that would also be required at the GMD VOC test site. These facilities are listed in table 2-1; the NMD Deployment EIS analysis of these facilities is incorporated by reference. The impacts of these facilities are included in the cumulative impacts analysis of this EA.

## Operation

The GBI VOC test site operations could include missile assembly and checkout; installation of the EKV bi-propellant tanks onto the EKV; inspection of the tanks after installation; installation/pressurization of pressure vessels on the EKV; final inspections, testing, and checkout of the loaded EKV assembly; integration of the EKV with the booster; and placement of the interceptor into the silo. The EKV may be integrated with the booster in the silo. It also may be integrated with the upper booster stage prior to integration with the remainder of the booster.

Assembly and checkout operations on the EKV such as testing pressure vessels for leaks, installation of the bi-propellant tanks, checking electronics and wiring, and final testing of the loaded EKV could be performed in the EKV Assembly and Checkout Facility. Assembly and checkout operations on the interceptor missile such as installing and checking electronics, wiring, and ordnance, mating to EKV, and final acceptance checks could be performed in the MAB. Once verified and checked out, the interceptor would be transported to the missile field site and inserted into the silo by crane or other handling equipment. Depending on the final interceptor design, some booster integration activities could also be performed in the silo.

Once placed, the interceptors would remain in the underground silos at the GBI VOC test site, except for removal for maintenance or because of upgrades or modifications to the silos. Typical tests performed at the GBI VOC test site with the GBI and other components would include hardware and software functions, component data communications interfaces, systems interfaces, and pre-mission or integrated mission test support functions. Equipment reliability in a realistic environment and maintenance concepts could also be evaluated. Some testing would also be performed on the interface between the missile and the EKV while it is in the silo. As previously discussed, there would be no flight testing of the missiles during test activities analyzed in this EA. Should it be determined that conducting a small number of checkout flights from the GBI VOC test site is feasible and would be useful to validate the deployment concept, supplemental environmental analysis would be performed as appropriate.

The GBI VOC test site would use utilities supplied by an offsite commercial supplier for environmental control of the silos, GBI storage, and activities associated with readiness. A backup battery system and onsite backup generators would supply emergency power. Generators for various GBI VOC test site-related facilities would range in output from approximately 30 to 1,650 kilowatts (kW). Each generator would also have its own dedicated aboveground (fuel) storage tank (AST). These dedicated tanks would range in capacity from approximately 1,890 to 34,065 liters (500 to 9,000 gallons).

Small amounts of hazardous materials usage would be associated with the GBI VOC test site activities. These materials would include protective coatings, lubricants and oils, motor and generator fuels, cleaning agents (isopropyl alcohol), backup power batteries, adhesives, and sealants used in periodic inspection and preventative maintenance to

interceptor support systems, such as power supplies, environmental control systems, communications systems, and security systems.

Liquid propellant (consisting of the fuel and oxidizer) would be used in the GBI EKV. These materials would be contained in tanks installed on the EKV and would not be released at the test site except in the unlikely event that a system leak occurred.

### **Safety Systems**

Specific safety plans would be developed to ensure that each operation is in compliance with applicable regulations. General safety measures would be developed by the facility user to ensure that the general public and site personnel would be provided with an acceptable level of safety. The main safety requirements for the GBI VOC test site are listed below.

#### *Fire Protection*

Fire protection, alarm, and suppression systems would be provided to GBI VOC test site facilities as appropriate.

#### *Security*

Security requirements would be an integral component of program safety. Security measures would be incorporated within the project design and operation procedures. Components of test site security would include a perimeter security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. The clear zone on the inner side of the fence would contain remotely operated lights and cameras. All vegetation would be cleared inside the security fence. Vegetation would be cleared to approximately 15 meters (50 feet) outside the security fence.

#### *Quantity-Distance Criteria*

DoD Explosive Safety Quantity-Distance (ESQD) criteria are used to establish safe distances from explosive hazard areas to non-related facilities and roadways in accordance with DoD Directive 6055.9, *DoD Ammunition and Explosives Safety Standards*. For analysis purposes, the ESQD for the GBI silos, the MAB, and the interceptor storage facilities was based on a distance up to 503 meters (1,650 feet) from inhabited buildings. The ESQD for the EKV Assembly and Checkout Facility and liquid propellant storage facilities was based on a distance up to 183 meters (600 feet) from inhabited buildings. Actual ESQDs may vary based on final facility design.

### **Mancamps and Support Facilities**

Currently, there may be a requirement for mancamps at one or more of the VOC sites. Existing housing, dining, and recreation resources would be used if available. The contractors selected to perform the construction may provide housing for their workers at an off-site location that the contractor selects.

The mancamps could provide office space; housing units; dining facilities; a medical treatment area; and morale, welfare, and recreation activities such as fitness and television rooms. The mancamp areas may be fenced and gated with controlled access to restrict entry.

The mancamp sites would be prepared by clearing, hauling of gravel fill, leveling, and compaction. Roads and parking areas would be created with gravel fill and drainage ditches. Lighting would be installed for security and parking. Headbolt heaters would be provided as required at parking locations to prevent vehicle engines from freezing. Utility services would be provided by the Government or commercial sources and would be brought into the sites with minimum connectivity. Facility units would be erected on pedestals or block foundations. Covered walkways would be constructed to provide protection from the winter conditions between buildings. The units and related material would be transported to the military installation or off-site location by air, sea, land, or rail.

It is anticipated that mancamps would be installed prior to the start of construction. The mancamps could be expanded as necessary should additional personnel arrive to work at the test site. Mancamp units would be temporary structures and would be removed when no longer needed.

### **2.2.2 BMC3**

BMC3 is the integrating and controlling component for the GMD test locations and facilities. It includes the equipment, communications, operations, procedures, and personnel essential for planning, directing, and controlling assigned assets required to accomplish the GMD mission. BMC3 provides mission and engagement planning, and situation assessment, and directs system responses. The BMC3 comprises three sub-components:

- BMC2 provides the command and control planning, tasking, threat analysis, and decision aids. An Execution Level BMC2 Node would be located at the GBI VOC test site and would provide backup communications between the Command Level Node which provides the command and control planning, tasking, threat analysis, and decision aids to support the GMD test activities (including an ability to support conduct of integrated flight tests as is currently accomplished from the Reagan Test Site at Kwajalein). The Element Site Communication Node provides communications between GMD components.
- The IDTs provide communications links between the BMC2 function and the in-flight interceptor for target updates and status communications.
- The GCN provides the communications links between GMD components and the network management and interfaces to external systems.

### 2.2.2.1 BMC2 Node Locations

The potential locations of the BMC2 Nodes that would be required to support the GMD test activities would include the following (figure 2-1).

- Peterson AFB, Colorado (Command Level Node workstation)
- Shriever AFB, Colorado (Command Level Node workstation)
- Cheyenne Mountain Complex, Colorado (Command Level Node workstation)
- Boeing Facility, Anaheim, California (Element Site Communications Node workstation)
- Boeing Facility, Huntsville, Alabama (Element Site Communications Node workstation)
- Beale AFB, California (Element Site Communications Node workstation)
- Eareckson AS, Alaska (Element Site Communications Node workstation)
- GBI VOC Test Site (Fort Greely or Clear AFS, Execution Level Node workstation)

One or all of the BMC2 Nodes identified above could be established as part of the GMD test activities. Establishing the BMC2 Nodes would require only minor modifications to existing facilities (as discussed in section 1.5), hardware and software upgrades, and connecting to existing FOC circuits.

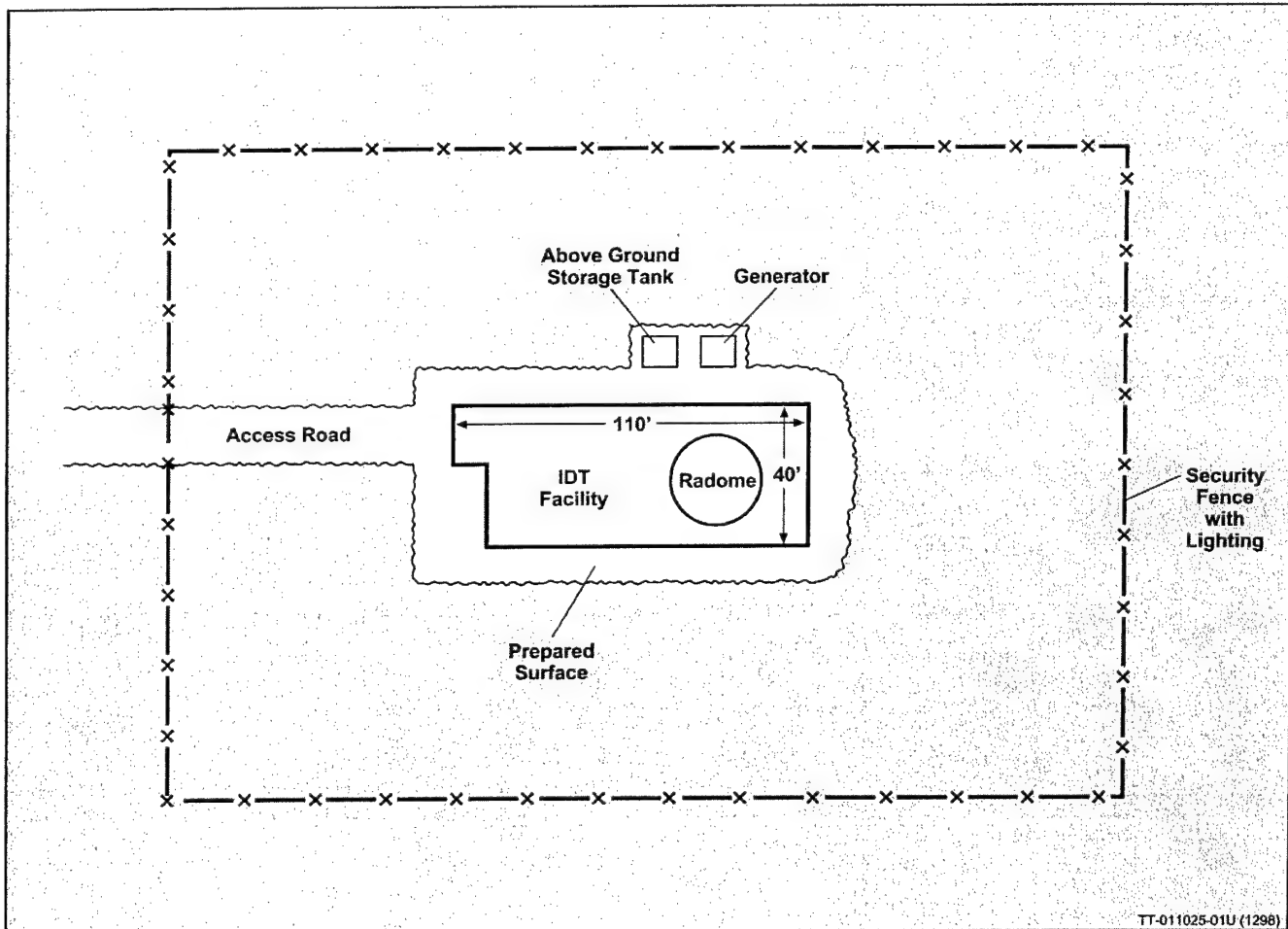
### 2.2.2.2 IDT

The IDT is a remotely operated communication ground station, which is a sub-component of the BMC3. It provides an in-flight communications link between the BMC2 Node and GBI, and transmits target update information to the GBI. The IDTs would be geographically distributed to provide effective system performance.

The IDT would be contained in a building that is approximately 30.8 meters by 11.6 meters (110 feet by 40 feet) that would have a radome mounted on one end, and a weather vestibule (to include dual wind shelters) on the other end (figure 2-2). An external aboveground fuel tank and a generator for backup power would be located near the building.

#### Construction

The IDT would be built on a seismically rated concrete foundation. An all-weather road to the IDT site would be required. A prepared surface perimeter around the building, at least 4.5 meters (15 feet) wide, would be required for crane access and parking for two utility and maintenance vehicles (figure 2-2). Two 9-meter (30-foot) anemometer (wind speed indicator) towers would be installed within the IDT site. Security fencing would be required around the facility. Telephone circuits would be required for voice communications and alarm monitoring. Sewage at the IDT would either be disposed of through a septic tank system or through an existing sewer system. Sewage disposal would be site dependent.



**Conceptual IDT Site Layout**

Not to Scale

**Figure 2-2**

If a septic tank system were used, it would be constructed in accordance with state and local requirements.

### **Operation**

The IDT is a part of the BMC3 component and would provide communications links between the GBI missile and the BMC2 subcomponent. The IDT is a radio transceiver that would only transmit/receive when a GBI missile is being tested. Tests could occur on the radome support system during adverse weather conditions (temperature, wind, humidity, ice/snow loads), facility/equipment operability, and communication links. Power to an IDT site would be from commercial offsite sources. A 300-kW generator would supply backup power. An AST with a fuel capacity of 3,785 to 5,678 liters (1,000 to 1,500 gallons) would supply fuel to the backup generator. The backup generator would be tested for approximately 45 minutes every 2 months. The rights-of-way for the IDT would provide space for fire protection water and hot water supply and return lines and steam heat. Overhead lines would supply electrical power.

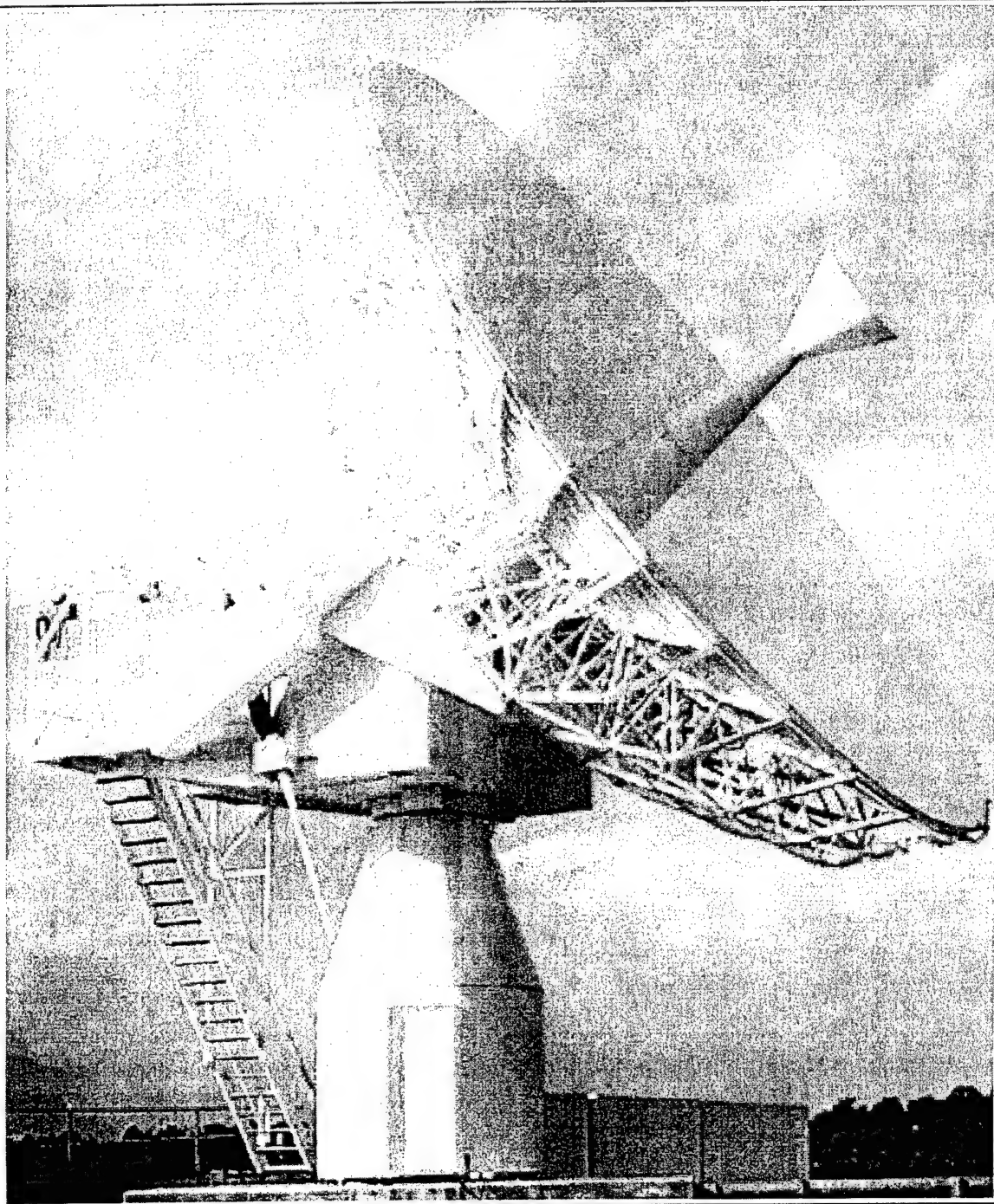
#### **2.2.2.3 GMD Communication Network**

The GCN sub-component of the BMC3 component would provide the communications link between the GBI VOC test site and other GMD locations in addition to providing network management and interfaces to external systems. The GCN sub-components include the DSCS and both existing and new FOC circuits. The GCN component would include one remotely controlled DSCS and the FOC required to link the components and sub-components of the GMD test location activities.

### **Defense Satellite Communication System**

#### **Construction**

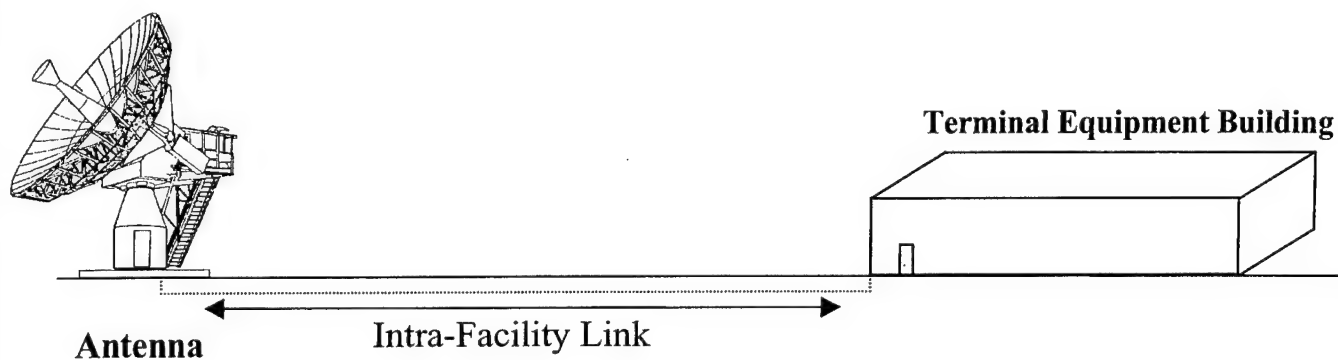
The DSCS earth terminal would consist of a satellite terminal (figure 2-3), an equipment building housing the communications enclosure, and backup power van (figure 2-4). The DSCS earth terminal would also have a dish antenna, protected by a radome, outside the equipment building. The equipment building would be sized to house a future Milstar communications van, a second power van, and an externally installed Milstar Extremely High Frequency Antenna Support Structure. Although a Milstar is not required for VOC purposes, one might be required if the GMD is deployed. Creating a building minimally larger than what is required for VOC would minimize the likelihood of having to construct another, separate building in the future. The current generation of Milstar satellite does not support the information data rates required, however, a new generation of advanced extremely high frequency satellite is under development. This capability would be more robust than DSCS and may supplement or replace the DSCS communications capability in the future. Security fencing would be installed around the facility. The primary power for the terminal would be commercial power. Water and sewer service would also be provided to the DSCS terminal. The DSCS terminal would have backup power for the critical load and standby power for the non-critical loads. The backup power system would be located in the equipment protection facility. A road would be required to provide vehicle access to the facility.



**Conceptual Defense  
Satellite  
Communication  
System**

---

**Figure 2-3**



**EXPLANATION**

**Conceptual Satellite  
Communication  
System Site Layout**

Not to Scale

**Figure 2-4**

## **Operation**

The DSCS is capable of remote monitoring and control through a centralized control, monitor, and alarm system. The DSCS would be operated remotely from the Readiness and Control Station of the VOC test site location. The DSCS would provide satellite communications among Eareckson AS, the GBI VOC test site, and the BMC2 Command Nodes at other locations.

## **Fiber Optic Cable**

### **Construction**

The FOC network would provide the communications link between the components and sub-components of the GMD test sites. Existing FOC would be used whenever feasible. Where new FOC is required, cable may be installed on either side of rights-of-way (normally roads or railroad tracks). The FOC would be buried to a depth of approximately 1 meter (3 feet) from the surface. Manholes and covers would allow access to the cables for maintenance and for future cable installations.

To the extent possible, candidate cable routes were identified along existing rights-of-way, minimizing the impact on the environment.

### **Operation**

The FOC system has three main operating components: a transmitter, a transmission medium, and a receiver. The FOC system uses light pulses to transmit information down fiber optic lines. The transmitter is the point of origin for information coming over fiber optic lines. It accepts coded electronic pulse information from a copper wire, and then processes and translates that information into equivalently coded light pulses. A light-emitting diode or injection-laser diode can be used for generating the light pulses. The light pulses are funneled into the fiber-optic medium, where they are transmitted down the line.

### **2.2.3 EARECKSON AS, ALASKA**

Potential construction (18 months) and operation of one IDT, two co-located DSCS earth terminals, software and hardware upgrades to the existing COBRA DANE Radar, installation of FOC, refurbishment of the existing power plant, and establishment of mancamps and associated support facilities for the GBI VOC test site would be required for the Proposed Action. The COBRA DANE Radar is located at Eareckson AFS on Shemya Island in Alaska. Upgraded hardware and software can provide unique sensing (search, acquisition, and track) and classification information. For the purposes of validating the GMD operational concept, COBRA DANE would participate in ground testing and would interact as a radar sensor in Shemya with BMC3 test components. Its location also provides the potential to test the BMC3 portion of the GMD element using real-time, real-world targets of opportunity, such as test launches that are within the radar's field of view. This would test the ability of the BMC3 to integrate and effectively use real-world data processed by the upgraded COBRA DANE as part of the GMD VOC test bed. The hardware and software upgrades, and related facility modifications would take place entirely within the COBRA DANE facility and would

involve changes to lower level electronics and signal and data processing. The modifications would not result in any change to maximum radar output.

#### **2.2.3.1 IDT**

##### **Construction**

One IDT would be constructed at Eareckson AS to support the GMD VOC test site activities. The IDT site 2, located in the north central part of the island, is the preferred site (figure 2-5). One alternate IDT site was also identified during the siting process and is located in the southeast part of the island. A construction laydown area may be located adjacent to the IDT building location. Trenching from the IDT to the power plant would be along existing roads or rights-of-way.

##### **Operation**

The IDT would provide communications links among the GMD components as described in section 2.2.2.2.

#### **2.2.3.2 GMD Communications Network**

The GCN sub-component at Eareckson AS would provide the communications link between all other sub-components of the GMD. The GCN component at Eareckson AS would include two co-located remotely controlled DSCS earth terminals and FOC.

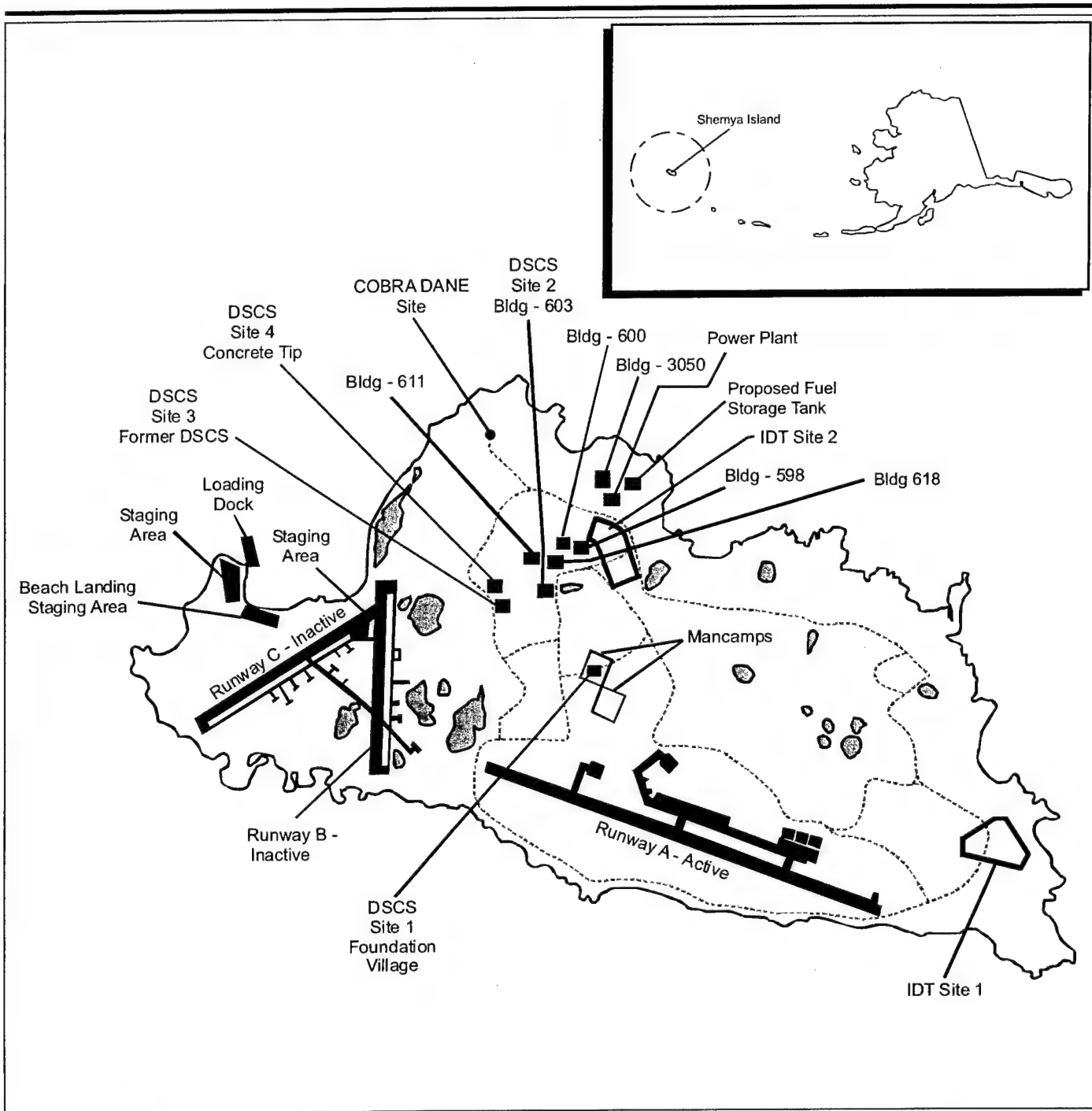
#### **Defense Satellite Communication System**

##### **Construction**

At Eareckson AS, the two co-located DSCS earth terminals would be constructed and installed at DSCS Site 1, Foundation Village, located in the center of the island (figure 2-5). Site 1 is the preferred site. The earth terminal complex would contain a single equipment building housing two communications enclosures and two backup power generators. The primary power for the terminal at Eareckson AS would be provided by the existing power plant. The DSCS terminals would have organic backup power for the critical load and standby power for the non-critical loads. The organic backup power system would be located in the equipment protection facility. Equipment would be added to the existing communications room of Building 618 to support this upgrade. A road would be required to provide vehicle access to the facility. A construction laydown area may be located adjacent to the DSCS terminal location. Three alternate DSCS terminal sites on Eareckson AS were identified during the siting process. Figure 2-5 also shows the alternate DSCS terminal sites 2 through 4.

##### **Operations**

The DSCS terminal is capable of remote monitoring and control through a centralized control, monitor, and alarm system. The DSCS would provide satellite communications between components and sub-components during GMD test activities.



## EXPLANATION

----- Proposed Fiber Optic Cable (FOC) Route

## Conceptual Test Facility Locations

Eareckson Air Station,  
Shemya, Alaska

Figure 2-5



Not to Scale

## **Fiber Optic Cable**

### **Construction**

FOC construction at Eareckson AS would be the same as described in section 2.2.2.3. Figure 2-5 shows the proposed FOC routes for Eareckson AS. This proposal is for terrestrial FOC only and does not include any routing of submarine FOC.

### **Operations**

The FOC operations at Eareckson AS would be the same as described in section 2.2.2.3.

### **2.2.3.3 COBRA DANE Radar**

COBRA DANE is a single faced, L-band, large phased array radar located at Eareckson AS. The primary purpose of the radar, shown in figure 2-6, is to detect and track foreign intercontinental ballistic missile and submarine-launched ballistic missile objects. The system provides 120-degree coverage of a 3,220-kilometer (2,000-mile) corridor that spans the eastern Russian peninsula and northern Pacific Ocean. Construction of the system started in 1973, and the COBRA DANE phased array radar became operational in August 1977. The COBRA DANE radar is housed in a 33.5-meter (110-foot) high building. The active portion of the array resides in a circle with a 28.8-meter (94.5-foot) diameter. COBRA DANE operates in the 1,215 to 1,400 megahertz (MHz) band and generates approximately 15.4 megawatts (MW) of peak radio frequency (RF) power (0.92 MW average) from 96 traveling wave tube amplifiers arranged in 12 groups of 8. This power is radiated through 15,360 active array elements, which together with 19,408 inactive elements compose the 28.8-meter (94.5-foot) diameter array face. The antenna is oriented approximately toward the west, monitoring the northern Pacific test areas.

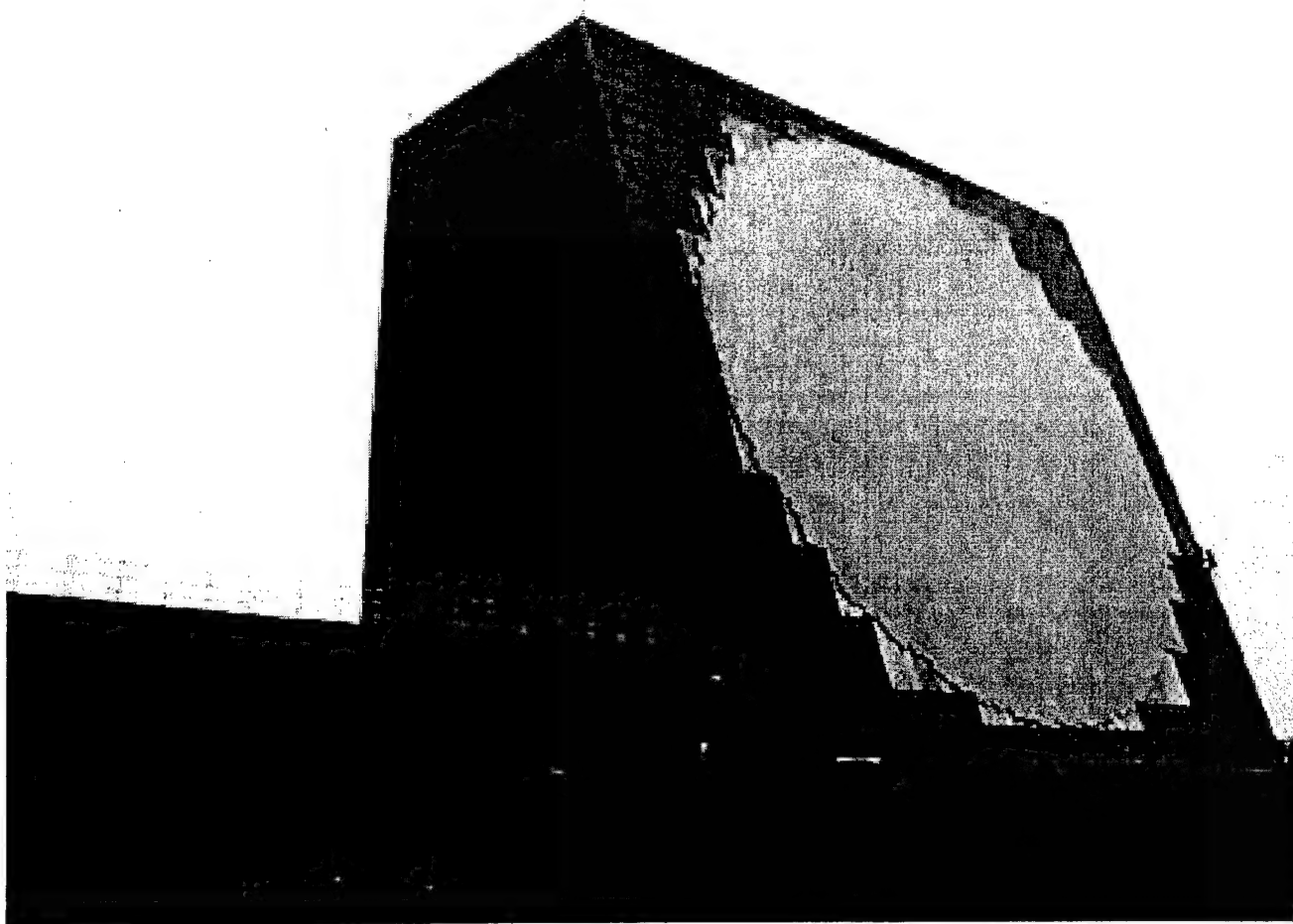
The COBRA DANE system was upgraded between 1990 and 1993 under the ESC/ICR (Hanscom AFB) COBRA DANE System Modernization program. The modernization upgrade involved replacing aging and unsupportable radar, computing and communications interface equipment, and all automated data processing equipment and recording peripherals. The majority of the transmitter, array, and facilities subsystems remained intact. All operations software was rewritten and enhanced using the Ada computer language.

### **Construction**

The proposed modifications to the COBRA DANE facility, Building 4010, would include the addition and replacement of electronic hardware and computer software and alterations to the interior of the building. No exterior modifications or ground-disturbing activities are anticipated. Interior walls would be moved to accommodate new equipment.

### **Operation**

The Proposed Action is to incorporate the GMD mission into the current computer software at the existing COBRA DANE in support of GBI VOC test site activities. The upgraded radar would also be able to provide simulated target data in combination with the existing ground based radar prototype at the Ronald Reagan Ballistic Missile Test Site at the Kwajalein Atoll in support of test activities. The hardware modifications required for the



**COBRA DANE**

Shemya, Alaska

**Figure 2-6**

test activities would consist of adding communications, test electronics and Automatic Data Processing enhancement (VAX) to a 4-Central Processing Unit configuration with memory expansion to 256 megabytes. The modified software would incorporate the GMD object test tracking and reporting, and BMC3 communications interplay. The upgrades to hardware and software would not change the power input or output of the COBRA DANE.

Once upgraded, the current mission and operations would continue, but with the new additional role of supporting GMD test activities. During routine Space Track operations (24 hours a day, 7 days a week), the radar normally operates at a reduced/limited duty factor of 1.5 percent. To allow the radar to collect the maximum data possible during tracking, the radar automatically runs-up and operates at its full duty cycle of 6.0 percent for the approximately 15-minute event. After the last tracked object has left its field-of-view, the radar then automatically runs back down and operates at its limited duty factor. However, the radar as designed can operate at its full duty cycle for 24 hours a day, 7 days a week. It is routinely operated at a limited duty factor to reduce the overall diesel generator maintenance and diesel fuel cost for the Shemya Power Plant. It is anticipated that during GMD test events, the radar would operate at its full duty factor of 6.0 percent. Support of GMD test events would increase the number of personnel assigned to the radar. The additional GMD test periods could increase radar equipment repair and the materials used and waste generated in maintaining the COBRA DANE system. It is anticipated that training for the test activities would be less than 1 percent of the total usage.

#### **2.2.3.4 Refurbishment of Existing Power Plant**

The U.S. Air Force is currently overhauling five of the six existing generators. The GMD Program Office anticipates reworking the control system and mechanical system of the power plant to increase reliability. Repairs would be made to the foundation of the sixth generator, and then it would be overhauled as well. It is anticipated that a 9.5-million-liter (2.5-million-gallon) fuel tank would be installed and connection made into the existing piping system. No increase in electricity producing capacity of the power plant is anticipated.

Currently, Eareckson AS is classified as a major emissions source and the U.S. Air Force maintains a Title V Air Permit issued by the Alaska Department of Environmental Conservation (ADEC). The refurbishment of the power plant would not increase or change fuel consumed or pollutants emitted.

#### **2.2.3.5 Mancamp, Administrative and Support Facilities**

##### **Mancamp**

Construction workers may be housed in the existing facilities in Building 598, or may require a temporary mancamp. If a temporary mancamp is required, it would be established in the vicinity of Foundation Village near the center of the island (figure 2-5). The mancamp would provide living accommodations for the Prime Contractor and U.S. Army Corps of Engineer's construction contractors for a minimum of 35 and a maximum of 200 personnel. Personnel housed in the mancamps would use the existing dining facilities at Eareckson AS. With the exception of the dining facility, the Eareckson AS mancamp could be similar in design to the mancamp described above in section 2.2.1. It would most

likely consist of trailers or portable buildings. The size and composition of the mancamp would be determined by the number of construction contractors.

The mancamp site would be prepared by clearing, hauling of gravel fill, leveling, and compaction. Roads and parking areas would be created with gravel fill and drainage ditches. Selection of the mancamp site would avoid damage to crowberry, the main Fall food for the Aleutian Canada goose, to the extent practicable. Lighting would be installed for security and parking. Facility units would be erected on pedestals or block foundations provided by the housing vendor, and portable toilets could be required temporarily. Covered walkways would be constructed to provide protection from the winter conditions between buildings.

Utilities would be provided from on-island resources, and the mancamp would be established in compliance with all applicable statutes and regulations. However, portable latrines may be required.

#### **Administrative and Support Facilities**

The Proposed Action at Eareckson AS would include the use of the following existing facilities and indicated activities (figure 2-5):

- Building 500—Construction material storage
- Building 521—Equipment and construction material storage
- Building 598—Housing; refurbishment would include heating repair, re-painting and re-carpeting, and installation of a sprinkler system.
- Building 600—Office space; housing, general refurbishment, and operation of an Element Site Communication BMC2 Node
- Building 605—Vehicle storage
- Building 611—Electronics maintenance shop (room 103)
- Building 616—Vehicle and equipment maintenance and storage
- Building 618—Communication equipment
- Building 3050—Warehouse, office space, and IDT assembly area; general refurbishment

Support facilities and related staging areas would be required to temporarily store equipment and materials required for construction and operation of the GMD test facilities. Three staging areas would be used at Eareckson AS and are located at the western end of the island near the loading dock and inactive runway (figure 2-5). Additional laydown and staging areas would be used at the components' construction sites and adjacent to the facilities listed above. These areas are located on previously disturbed ground. Administrative and storage areas at the COBRA DANE may also be used.

#### **2.2.4 BEALE AFB, CALIFORNIA**

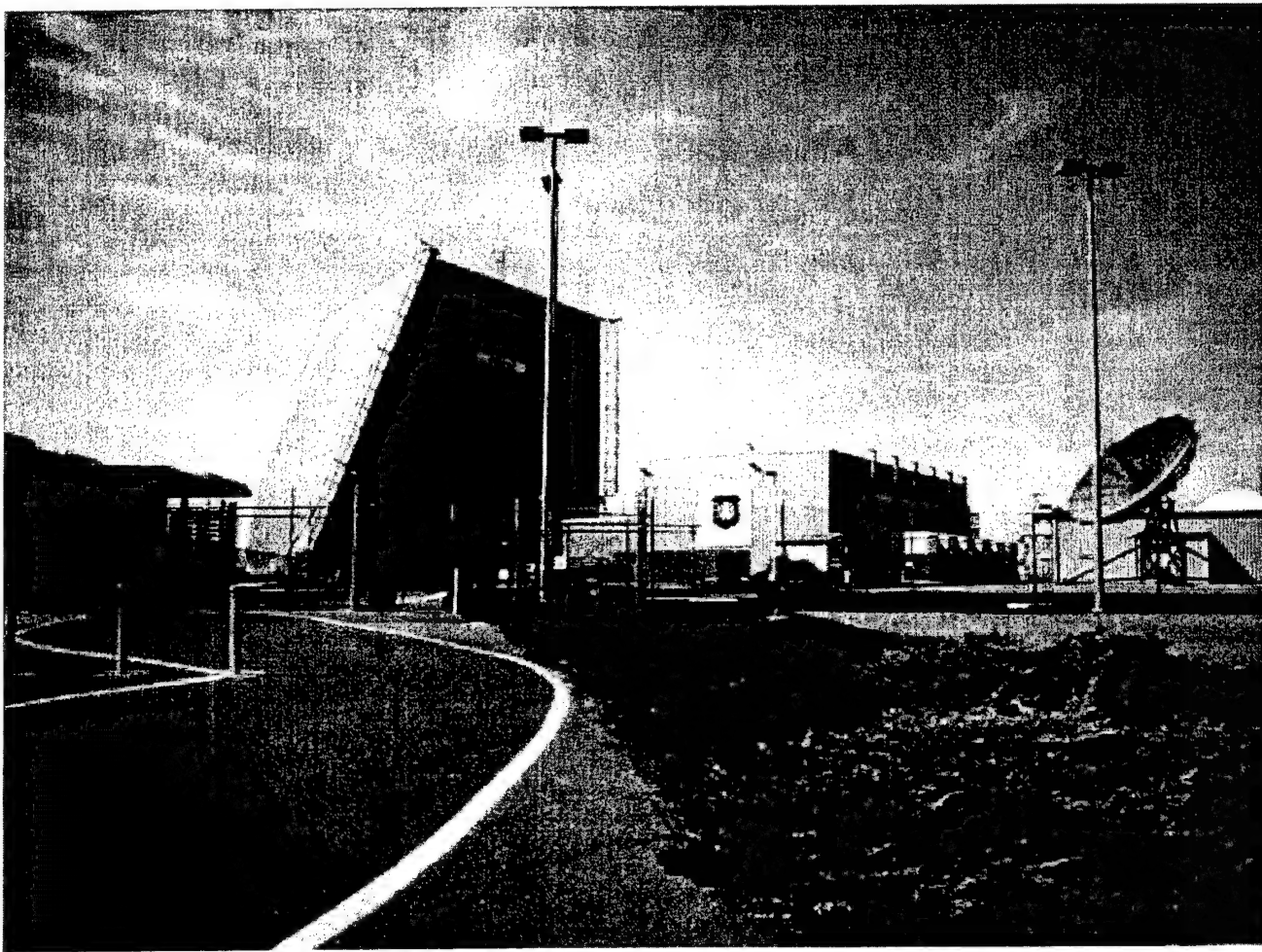
The proposed modifications to the existing Beale AFB EWR would include new software and hardware, and interior building modifications to accommodate the new hardware. The EWR as upgraded would be referred to as the UEWR. The proposed hardware and software modifications were analyzed in Appendix H, "Upgraded Early Warning Radar Analysis," of the NMD Deployment EIS. This analysis is incorporated by reference. Upgrading the software and hardware of the existing EWR would allow the program to test the effectiveness of improved algorithms for acquisition, tracking, and classification. This would include evaluation of the ability of the BMC3 component to integrate and effectively use data supplied by the proposed UEWR to the GMD VOC test site.

The proposed UEWR would be the initial search and track component of GMD VOC testing and could be used in a simulated mode to test the interoperability of the GMD VOC components. Proving interoperability is an essential part of the validation of the operational concept. The proposed UEWR at Beale AFB could also provide vital information for tests currently being performed on existing test ranges in support of other GMD activities. The UEWR could pick up signatures from standard target missiles launched from Vandenberg AFB, an existing test range, over the Pacific Ocean when the missile passes through the UEWR's surveillance fence. The upgraded computers and programming could then pass accurate identification and trajectory information on to a BMC3. The BMC3 could then cue the existing radar at Kwajalein with this information. The interceptor missile could then be launched from the existing test site on Kwajalein and directed to the target missile by the cued radar. The Beale UEWR could also participate in U.S. Air Force risk reduction flights launched from Kodiak in order to further test radar performance and interactions with BMC3.

Beale AFB is one of only three operating EWRs sites in the United States; the other two are Cape Cod AFS, Massachusetts and Clear AFS, Alaska. The Beale EWR was sited at its current location to maximize the ability to perform critical defense missions, including acquisition and tracking of ballistic missiles aimed at the United States. The location of the Beale EWR on the west coast makes it the only EWR that can provide full tracking coverage for GMD test activities.

The PAVE PAWS (PAVE is a U.S. Air Force program name, while PAWS stands for the Phased Array Warning System) EWR is a surveillance and tracking radar system operated by the U.S. Air Force at Beale AFB, California, (figure 2-7). The existing PAVE PAWS facility at Beale AFB has been operational since 1980. No substantial changes to the building infrastructure or personnel burden on the site would be required.

The PAVE PAWS radar is housed in a 32-meter (105-foot) high building with three sides. Two flat arrays of individual radiating elements transmit and receive RF signals generated by the radar. The equipment that generates the RF signals and then analyzes the reflected signals is housed inside the radar building. The two array faces are 31 meters (102 feet) wide and tilted back 20 degrees from vertical. The active portion of the array resides in a circle 22.1 meters (72.5 feet) in diameter in the center of the array. Each radiating element is connected to a solid-state transmit/receive module that provides 325 watts of



## PAVE PAWS

Beale Air Force Base, California

**Figure 2-7**

power and a low-noise receiver to amplify the returning radar signals. The RF signals transmitted from each array face form one narrow main beam with a width of 2.2 degrees. Most of the energy (approximately 90 percent) is contained in the main beam.

As analyzed in the NMD Deployment EIS, the radiated peak and average power, and operating bandwidths of the upgraded EWR would remain unchanged from current operations of the EWR. The proposed modifications would not increase the output or duty cycle of the radar, and thus would not increase the total energy emitted during operation. Rather, instead of increasing system performance by increasing power, the electronic hardware and computer software replacements would effectively result in enhanced detection and discrimination capabilities. This GMD VOC EA incorporates that analysis and consequently will focus on the interior modification to accommodate installation of the new hardware and software.

The U.S. Air Force, which operates and has real property accountability over the PAVE PAWS EWR facilities, has begun the process for a separate NEPA analysis to determine the long-term status of all of the EWRs in the United States. The U.S. Air Force may not complete its NEPA analysis for several years. Upgrades to the Beale AFB EWR to support the test function of validating the GMD operational concept would not foreclose any action the U.S. Air Force determined to be appropriate, after completing its NEPA analysis. The UEWR would be able to search for different types of missiles and distinguish hostile objects (warheads) from other objects, and provide this data to other GMD components using improved communications systems.

### **Construction**

The Beale AFB EWR facility would only require interior modifications. Current offices and a conference room would be modified for installation of the new equipment on the first, third, and fourth levels. A new Computer Maintenance Operations Center would be constructed in existing office space on the first level of the existing facility. After UEWR acceptance, the vacated spaces would be converted to replace the offices and conference room. Some modifications would also be made to existing radar and training equipment rooms to install new equipment.

The hardware modifications, analyzed in Appendix H of the NMD Deployment EIS, would consist of replacing existing computers, graphic displays, communication equipment, and the radar receiver/exciter to perform the GMD testing. The EWR software would be rewritten to incorporate the GMD test function and allow the improved acquisition, tracking, and classification of small objects.

### **Operations**

Upgrading the computer hardware and software of the EWR at Beale AFB would effectively provide enhanced acquisition and tracking of target missiles for the proposed GMD test activities. Existing equipment would continue to function during the modifications. After the new hardware and software is tested and installed, the duplicate existing equipment would be removed.

Once upgraded, the current EWR operations would continue with the addition of conducting GMD test missions (i.e., identification and precise tracking of a test ballistic missile launched against the United States) and training exercises. During GMD test operations and training, radiated peak and average power would be identical to current EWR operations. In either case, the physical characteristics of the radar (radiated peak and average power, operating bands, etc.) would be the same whether EWR or GMD test operations are being conducted. During GMD test operations a different radar pattern would be used and different algorithms used to interpret the raw data from the radar returns. There would be no change to the number of personnel operating the radar or in the amount of hazardous materials and waste generated by the UEWR when compared to the EWR. It is anticipated that training for GMD test activities would be less than 1 percent of the total usage. At all other times, the UEWR would continue to perform its current EWR missions.

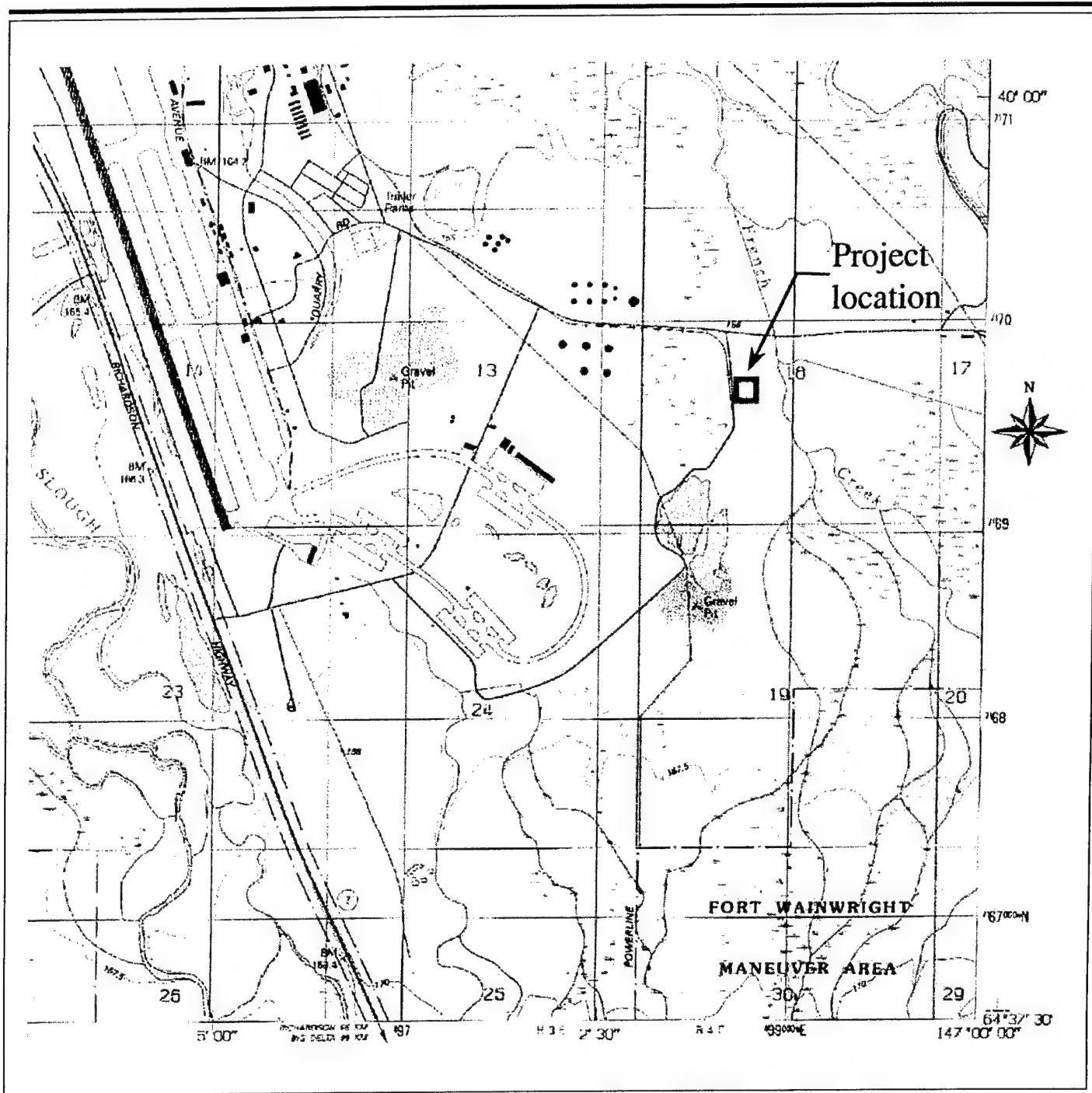
As stated above, the proposed modifications would not increase the output or duty cycle of the radar or increase the total energy emitted during operation. Instead of increasing system performance by increasing power, the electronic hardware and computer software replacements would effectively result in enhanced detection and discrimination capabilities.

#### **2.2.5 EIELSON AFB MISSILE TRANSFER FACILITY**

Most equipment and interceptor components could be flown by air transport into Eielson AFB near Fairbanks, Alaska. Upon arrival at Eielson AFB each interceptor would be transferred from the aircraft to a cargo loader for transport to the GBI VOC test site or movement to a Missile Transfer Facility to be constructed on Eielson AFB, as shown in figure 2-8. A Missile Transfer Facility would support cold weather loading/off loading and storage requirements of the interceptor and support equipment. Missiles would only be placed in the transfer facility if conditions exist which would not allow the missile to be transported immediately to the GBI VOC test site. The base master planning function initially proposed two locations for the Missile Transfer Facility. One of the two locations was located at the end of the Base's active aircraft runway. This location was determined to be unacceptable because of ESQD requirements for the missiles, which would be located in the transfer facility.

##### **Construction**

The Missile Transfer Facility would be constructed at a gravel parking/storage pad located off Mullin's Pit Road, approximately 1.6 kilometers (1 mile) from the runway on Eielson AFB. The location would also maintain the minimum ESQD separation from other facilities as required by U.S. Army, U.S. Air Force, and DoD regulations. The road from the runway to the new transfer facility would require resurfacing and portions would require straightening and/or widening. Lighting fixtures and a security fence would have to be installed around the transfer facility. The roads leading off base from the new transfer facility to Highway 2 (approximately 0.8 kilometer [0.5 mile]) would require resurfacing and its entrance would have to be modified. An 18-meter (60-foot) hardtop surface with a sliding 18-meter (60-foot) gate, lighting, and communication lines to the security forces must be available at the gate. A 36-meter (120-foot) emergency pull-off ramp on the



**EXPLANATION**

# **Missile Transfer Facility**

Eielson Air Force Base, Alaska

**Figure 2-8**



Not to Scale

Richardson Highway (Route 2) would have to be installed so that the convoy and missile transporter could pull off the main highway for entry into Eielson AFB. In addition, several existing pull-offs could require minor modifications between Eielson AFB and the selected GBI VOC test site.

The pre-fabricated building would be large enough to accommodate two cargo loaders. The building would be approximately 30.5 meters (100 feet) long by 15 meters (50 feet) wide.

## Operation

The Missile Transfer Facility would only be used to store interceptors and their parts on a short-term basis. The GBI would be transferred to a missile transporter inside the Missile Transfer Facility and then surface transported to the GBI VOC test site. Typically interceptors would only be stored overnight. The transfer facility would normally be unoccupied. The facility's power would be supplied by existing base power, but a generator would provide a backup power supply.

## 2.3 PREFERRED GBI SITE

The Preferred Alternative would be to construct and operate the GBI VOC test site at Fort Greely, Alaska and related support facilities at other locations as shown in table 2-2.

**Table 2-2: GMD VOC Preferred Alternative, One GBI Site with Six Silos**

GBI	BMC2	IDT	DSCS Terminal	Radar Support	Transportation	UEWR
Fort Greely	Fort Greely	1 at Fort Greely	1 at Fort Greely	COBRA DANE Eareckson AS	Allen Army Airfield Repair	Beale AFB
	Peterson AFB, Shriever AFB, Cheyenne Mountain Complex, Boeing Facilities, Beale AFB, and Eareckson AS	1 at Eareckson AS	2 co-located at Eareckson AS		Missile Transfer Facility at Eielson AFB	

### 2.3.1 GROUND-BASED INTERCEPTOR

#### Construction

The GBI VOC test site at Fort Greely could contain six silos, a MAB, three interceptor storage facilities, an EKV Assembly and Checkout Facility, EKV fuel and oxidizer storage

facilities, and additional support facilities. Table 2-1 and figure 2-9 provide an overview of the GBI VOC test site facilities. An underground communication line currently on the west side of the GBI test site would be relocated outside the perimeter security fence. The final facilities designs, interceptor configuration, and layout of the test site have not yet been completed.

### **Operation**

Assembly and checkout operations on the interceptor missile and EKV would be performed in the MAB and/or EKV Assembly and Checkout Facility. Typical tests performed at the test location would include component-level and component-to-component tests, hardware and software functions, component data communications interfaces, component interfaces, and pre-mission or integrated mission test support functions. As previously discussed, there would be no flight testing of the missiles during test activities analyzed in this EA. Table 2-3 provides a list of facility requirements for the GBI VOC test site as described and analyzed in the NMD Deployment EIS.

The GMD VOC test site would also require use of a MAB, utilities building, Readiness and Control Station, fuel unloading area, and additional existing buildings (514, 601, 626, 628, 629, 658, 663, 675, and 701).

### **2.3.2 BMC3**

#### **2.3.2.1 BMC2 Node**

A BMC2 Element Site Communication Node would be located in the manned Readiness and Control Facility.

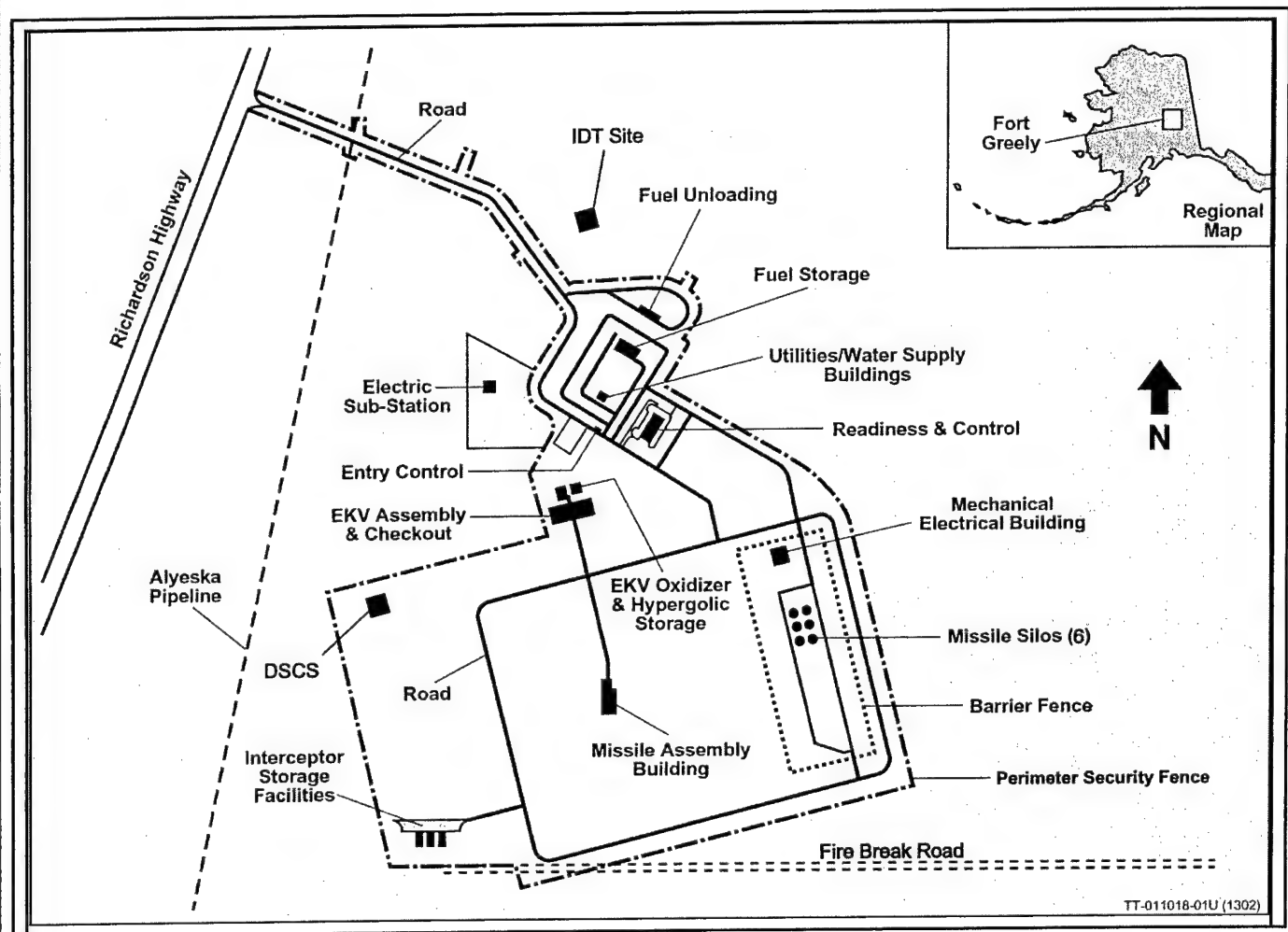
#### **2.3.2.2 IDT**

### **Construction**

One IDT would be constructed at Fort Greely to support the GMD test activities. IDT Site 9 is the preferred site and is 1,000 meters (3,281 feet) northwest of the missile field (figure 2-10). Eight alternate IDT sites were identified during the siting process. Figure 2-10 shows these sites.

### **Operation**

Locally available commercial electrical power would be the primary source of power for the IDT on Fort Greely. To support current requirements and anticipated near-term growth, a total of 225 kilovolt-amperes of 480/277 volt, 3-phase wye-connected power is required. The IDT site would not be manned.



EXPLANATION

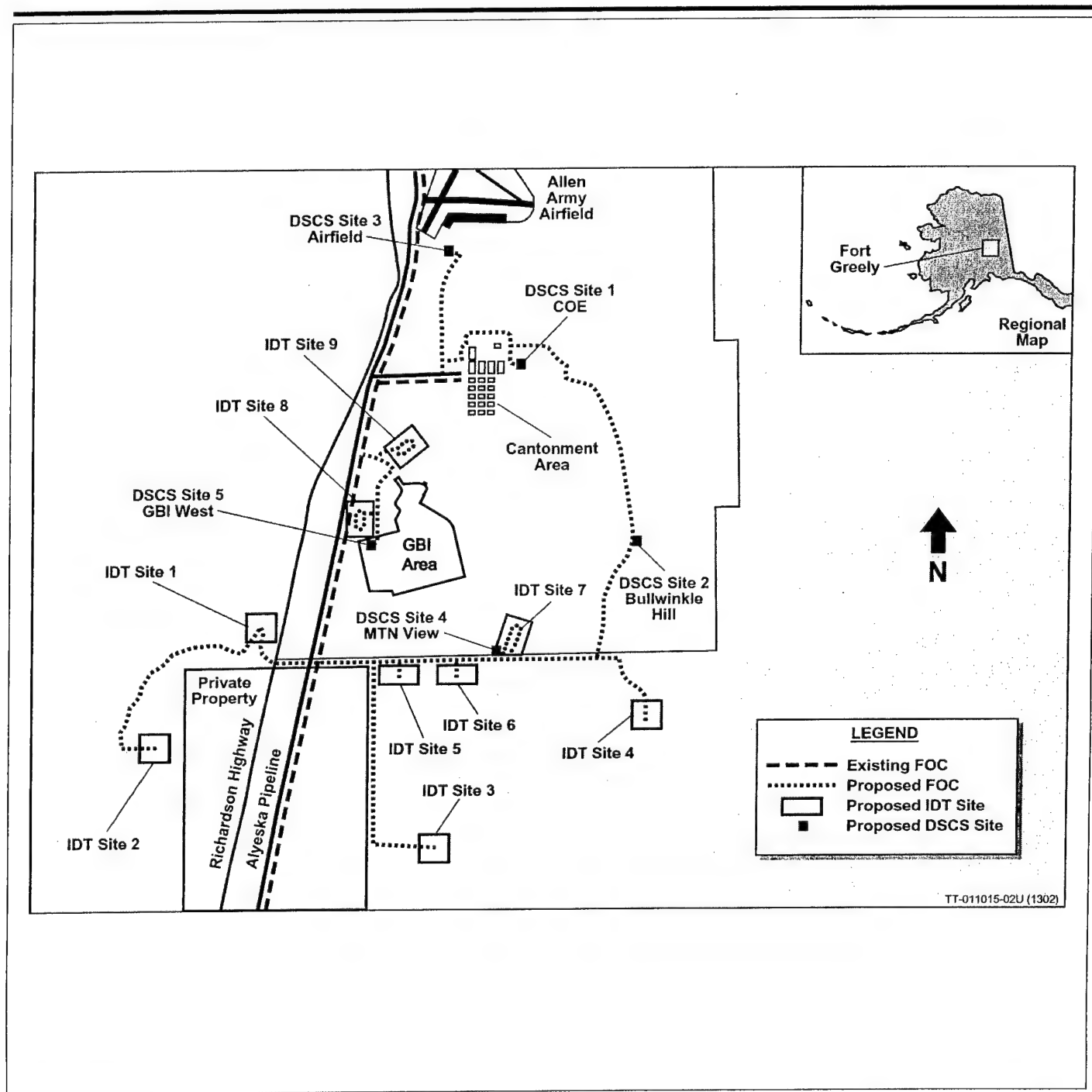
## Conceptual Layout of GBI VOC Test Facilities

Fort Greely, Alaska



Not to Scale

**Figure 2-9**



EXPLANATION

## Conceptual Test Site Layout

Fort Greely, Alaska

Figure 2-10



Not to Scale

**Table 2-3: GMD Facility Requirements, Fort Greely, Alaska  
as Described in the NMD Deployment EIS**

New Facilities	Existing Facilities Proposed for Use (Building Number)
Launch Silos	100—Hangar
Interceptor Receiving and Processing Facility	508, T-509, 601, 608, 612, 670— Warehouse/Storage and adjacent areas
Interceptor Storage Facilities	659-663, 702, 705-714, 804-806, 808-810, 812- 814, 816-818, 825-827, 829-831, 833-835, 850- 852, 854-856, 862-864, 875-877, 887-889, 895, 896, 910-946, 950-955—Housing
Headquarters Facility	
Silo Interface Vault	
Mechanical/Electrical Equipment Building	504—Fire Station
Administration and Maintenance Facility	605, 615, 626—Motor Pool
Backup Power Generation with Fuel Storage	503, 630, 654, 655, 658, 853—Administration
Security (Fencing, Lighting, Monitoring Equipment)	Runway—remove and reconstruct
Sewage Treatment (Septic Field)	101, 103, 106, 160, 162, 318-320, 338-341, 346, 347-354, 361, 609, 610, 628, 629, 635, 650-653, 656, 675, 701, 725, 801, 802, 820-822, 824, 845, 847
Steam Plant	
Substation	
Readiness Station	
Security Building	
Entry Control Station	
Roads/Utility Extensions/Water Wells	
Fuel Unloading Facility	
Water Supply Facility	

### 2.3.2.3 GMD Communication Network

The GCN subcomponent would include one remotely controlled DSCS and the FOC required to link the components of the GMD test activities.

#### DSCS

##### **Construction**

One DSCS earth terminal composed of a single antenna installation would be constructed at the preferred DSCS Site 5, GBI west approximately 1,000 meters (3,281 feet) west of the missile field (figure 2-9). A road would be required to provide vehicle access to the facility. Four alternate DSCS sites were identified on Fort Greely during the siting process. Figure 2-10 shows DSCS Sites 1 through 4.

##### **Operation**

The DSCS would provide satellite communications among Eareckson AS, Fort Greely, and the BMC2 Command Nodes during GMD test activities.

## **Fiber Optic Cable**

### **Construction**

Figure 2-10 shows the proposed FOC routes at Fort Greely. Existing FOC would be used whenever feasible.

### **Operation**

The FOC network would provide the communications link between the components and subcomponents of the GMD test sites.

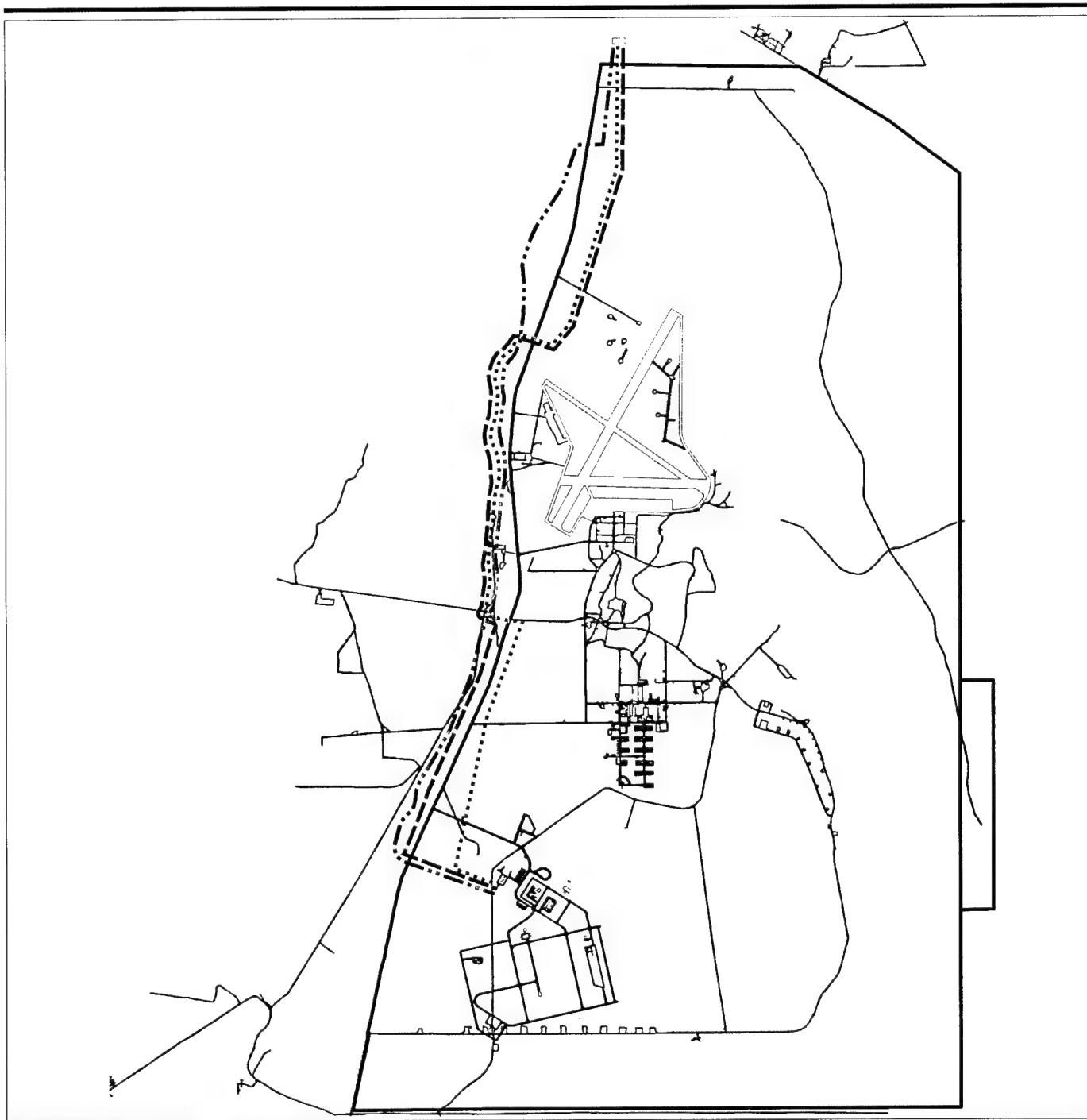
## **2.3.3 ELECTRICITY DISTRIBUTION UPGRADES**

To supply the 5 MW of electricity required for proposed GMD VOC test activities at Fort Greely, electric distribution system upgrades would be needed. The Golden Valley Electric Association would construct a new 138 kilovolt (kV) power transmission line from the Jarvis Creek substation to the Fort Greely GMD VOC test site. Figure 2-11 shows the proposed transmission routes. This expanded electric service would also support future needs, if Fort Greely were selected as an operational site. The power line would be installed on 24-meter (80-foot) metal or wood poles that would support three transmission lines. A clearing approximately 15 meters (50 feet) wide along the proposed route would be created in the trees (mainly birch and cedar about 6 to 9 meters [20 to 30 feet] tall) to allow for installation and operation of the line. For each alternative route, an effort would be made to maintain a 15-meter (50-foot) buffer zone between the highway and the area that would be cleared for the transmission line route.

### **Alternative Routes**

Five alternative routes were considered for the new transmission line from Jarvis Creek, but only three were carried forward for analysis (figure 2-11). The primary corridor for existing rights-of-way within the area is along Richardson Highway. The highway generally runs south to north with Fort Greely, the Jarvis Creek Substation, and the proposed GMD substation located east and adjacent to the highway. Major considerations for route selections east of the highway are Allen Army Airfield runways, Fort Greely Training areas, the existing power line, and the oil pipeline. Major considerations west of the highway are the following: a portion of the existing power line, limited space along portions adjacent to the highway, the airfield, and a significant decrease in elevation adjacent to the highway.

**Route 1**—This preferred route would essentially parallel the existing 25-kV route on the east side of the Richardson Highway. As with the current 25-kV route, it would cross the Richardson Highway near the western end of the East-West runway at Allen Army Airfield, descend to the River Valley, then immediately re-cross the highway upon leaving the area where there are airfield restrictions and continue south on the eastern side. Additional clearing would be required to allow the 25-kV line and 138-kV line to be installed along the same route. The existing 25-kV 9-meter (30-foot) right-of-way would need to be expanded to 15 meters (50 feet).



# EXPLANATION

- Boundary
- Roads
- ..... Proposed Power Line Route #1
- - - Proposed Power Line Route #2
- - - Proposed Power Line Route #3
- Airfield
- Substation

## Conceptual Golden Valley Electric Association Power Line Routes

Fort Greely, Alaska

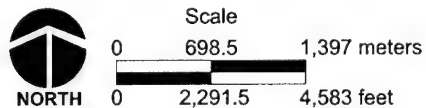


Figure 2-11

**Route 2**—Alternative route 2 would exit the substation and cross Jarvis Creek, essentially parallel with the oil pipeline and existing power line. Upon crossing the creek, it would immediately cross to the west side of the Richardson Highway, then travel south/southeast approximately 8 kilometers (5 miles). It would then re-cross to the east side of the highway at a point opposite the proposed GMD substation. The terrain west of Richardson Highway is initially the same as the highway, but after about 3 kilometers (2 miles) decreases in elevation approximately 15 to 24 meters (50 to 80 feet) to the Delta River Valley. The route would remain on the valley floor, following the contour line, until it reaches the point opposite the GMD substation. In the area opposite the Allen Army airfield, the west side of the highway is on the edge of the river valley. Due to the height and distance restrictions adjacent to the runways, all alternative routes would be required to extend into the valley in this area near the airfield. Two scenic overlooks are in the area where the line would be installed down the slope from the highway.

**Route 3**—This alternative would be identical to Route 1 until it ascends the slope out of the Delta River valley after it leaves the area near the airfield. At this point it would not cross the highway. It would continue to follow west of and adjacent to Richardson Highway until it was opposite the proposed GMD substation and would then cross the highway into Fort Greely.

#### **Alternative Routes Not Carried Forward**

**Route 4**—This alternate route was considered, but not carried forward for analysis. The route would travel east of the Jarvis Creek substation then turn south and follow 30-Mile Road, a dirt road through Fort Greely's training areas. After passing the airfield it would turn west to the GMD activity areas. This route would have to pass directly through Buffalo Drop Zone, which is an active drop zone used for U.S. Army airborne operations. Installation of the high voltage lines in these areas would preclude further use of Buffalo Drop Zone for airborne landings.

**Route 5**—This alternative considered upgrading the existing 25-kV line to 138-kV, but was not carried forward for analysis. This alternative would require new poles since the higher voltage would require additional ground clearance. The existing line would also have to be shut down for an extended period of time during the upgrades, interrupting service to customers, or worked on as a hot line requiring additional safety measures. This alternative was not practicable considering Alaska's weather conditions and the additional cost related to additional safety measures that would be required.

#### **2.3.4 MANCAMPS AND SUPPORT FACILITIES**

The NMD Deployment EIS evaluated use of existing facilities for personnel housing and administrative functions. Some of these existing facilities have been vacant since the base underwent realignment under the Base Realignment and Closure Act beginning in 1995. Because some of the facilities have been vacant since 1995, some level of renovation work would be required before their use. This EA incorporates the analysis of the NMD Deployment EIS as it applies to the use of existing facilities. The withdrawal from surplus of property declared surplus during the base realignment has allowed for existing facilities

to be available for the GBI VOC test site activities. Nine additional support facilities could be provided to the Prime Contractor for warehouse space and equipment maintenance space. These buildings (buildings 514, 601, 626, 628, 629, 658, 663, 675, and 701) have been retained by the host installation for the GBI VOC test activities. Building 626 could be used jointly by the construction contractor for equipment maintenance. Minor painting and heating, electrical, and plumbing system repairs would be performed as necessary to allow reuse of these facilities.

A proposed alternative to the renovation and use of the existing facilities is the construction of temporary living and working facilities, or mancamps, to provide housing, administrative, and quality of life activity space in support of the GBI VOC test site activities.

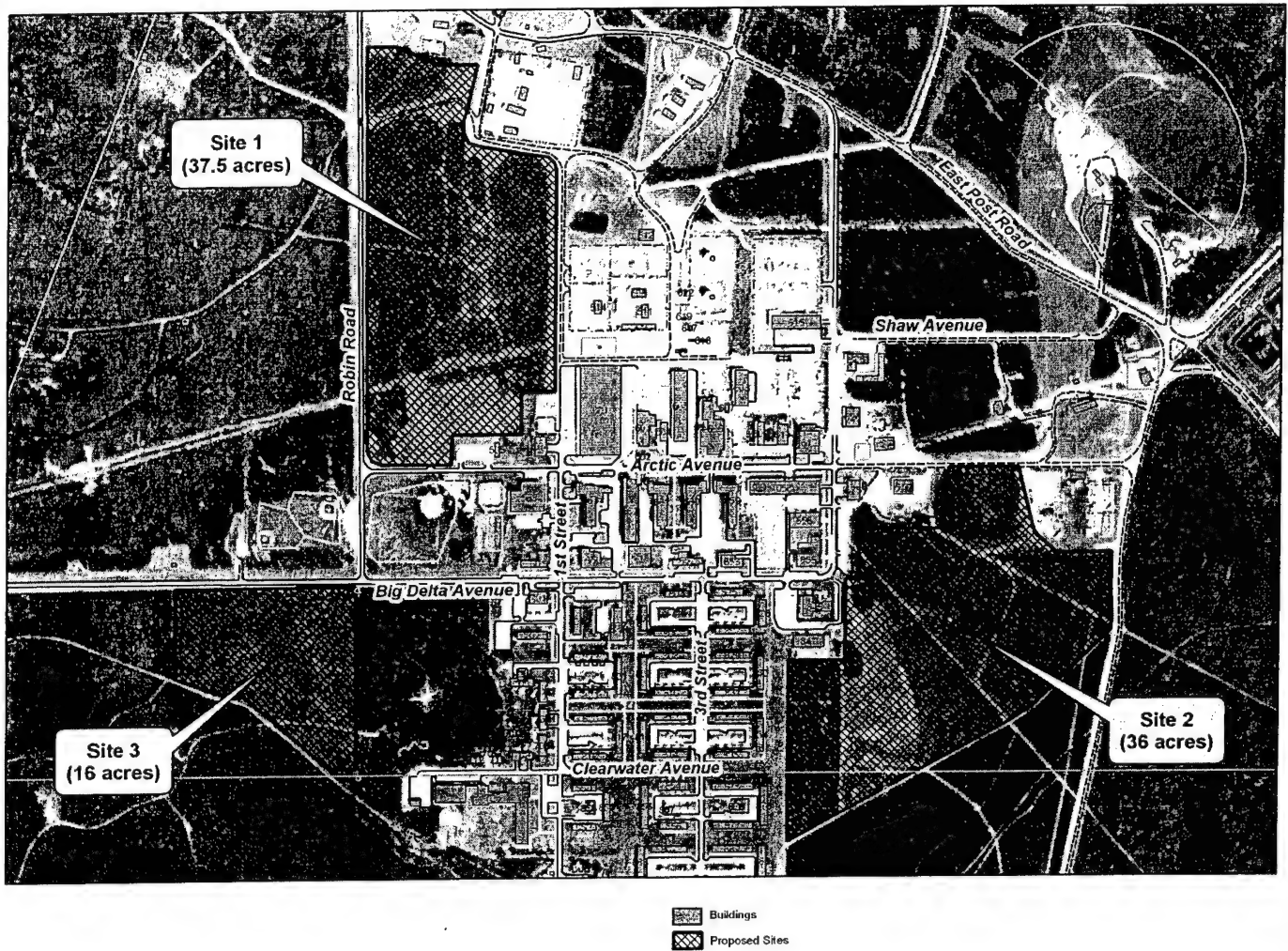
#### **Fort Greely Administrative Mancamp**

For the proposed mancamp alternative, it is currently anticipated that Government and Prime Contractor administration and operational personnel would be accommodated in an administrative mancamp near the GMD test site at Fort Greely.

A ground survey of Fort Greely was performed to determine optimum locations for siting the mancamp. Major siting considerations included proximity to existing utilities, road access, and environmental considerations such as biological and cultural resources and the presence of wetlands. Three sites near the Fort Greely Main Post were selected for consideration (figure 2-12). Currently, the preferred location for the mancamp would be at Site 2, on the east side of the cantonment area near Building 656. Site 2 is east of the existing housing area on 1<sup>st</sup> Street, south of Arctic Avenue, and west of 33 Mile Loop Road.

Potential Mancamp Site 1 is north of Big Delta Avenue, east of Robin Road, and west of 1<sup>st</sup> Street. Site 1 has road access on all four sides and provides access to Richardson Highway. There is no direct access to the proposed missile field.

Site 2 is near the shop and warehouse buildings proposed for use by the Prime Contractor and is also close to an underground utility corridor that supplies electricity, water, and sewer service. An electric power transmission line crosses the area, and there is road access to the site from all sides. In addition, the site could easily be separated into an accompanied housing area and an unaccompanied housing area, and the location provides access to the Richardson Highway without going through the Main Post area. The site provides nearly direct access to the missile field via an existing gravel road on the east side of the area. The north portion of the site is near the existing Military Satellite Communications terminals, and the east portion of the site is near the ammunition storage area.

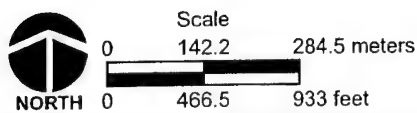


## EXPLANATION

## Potential Sites for GMD Administrative Mancamp

Fort Greely, Alaska

Figure 2-12



Site 3 is south of Big Delta Avenue and west of the existing housing on 1<sup>st</sup> Street. Site 3 has no access roads or nearby utilities, and would require further extension of utilities from the cantonment area. The close proximity of Site 3 to Richardson Highway would also increase security risks.

The Administrative Mancamp would provide office space for approximately 120 personnel, housing units and dining facilities for 200 personnel, a medical treatment area, and morale, welfare, and recreation activities such as fitness and television rooms. Two areas would be provided for office space for Government and Prime Contractor personnel, with each facility approximately 1,022 square meters (11,000 square feet) in size. The morale, welfare, and recreation facility would contain an area of approximately 948 square meters (10,200 square feet). The mancamp area would be fenced and gated with controlled access to restrict entry.

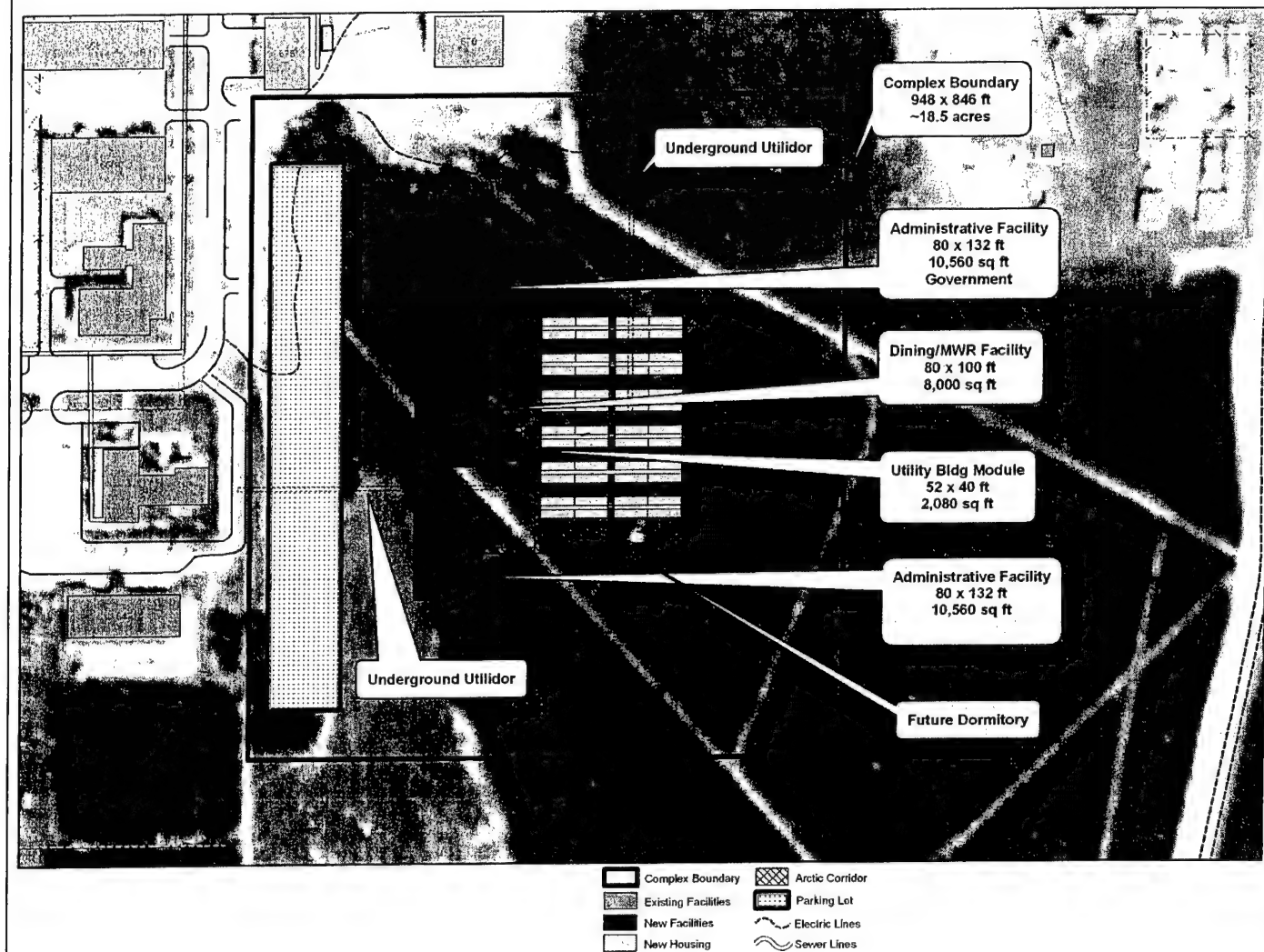
The mancamp site would be prepared by clearing, hauling of gravel fill, leveling, and compaction. Roads and parking areas would be created with gravel fill and drainage ditches. Lighting would be installed for security and parking. Headbolt heaters would be provided at parking locations to prevent vehicle engines from freezing. Electricity would be provided by Golden Valley Electric Association, with backup power provided by the onsite substation as needed. Facility units would be erected on pedestals or block foundations. Covered walkways would be constructed to provide protection from the winter conditions between buildings. Figure 2-13 shows a representative mancamp facility layout.

### **Operations**

The current schedule shows a total of 40 personnel onsite at Fort Greely at the beginning of construction. Until the administrative mancamp could be established, these personnel would be housed in three unaccompanied personnel housing buildings on Fort Greely. These units (Buildings 804, 805, and 806) have been retained by MDA for use in the GMD test site. These facilities would only require minor painting, maintenance, and cleaning, as well as furnishings to be operational. It is currently anticipated that the administrative offices, and the dining, medical, and morale, welfare, and recreation facilities would arrive at Fort Greely simultaneously with the initial housing units. The remaining housing units would arrive approximately 9 months later. The administrative mancamp could be expanded as necessary should additional personnel arrive to work at the test site. Mancamp units would be temporary structures and would be removed when no longer needed.

### **Offsite Construction Mancamps**

Each construction contractor would provide housing for its personnel, as it deems appropriate, most likely in the vicinity of Delta Junction, Alaska, and would provide its own administration and construction trailers at the Fort Greely GBI VOC test site during construction activities. Other potential housing in the vicinity of Delta Junction could



## EXPLANATION

## Representative Mancamp Facility Layout

Fort Greely, Alaska

**Figure 2-13**



Scale  
0 37.5 75 meters  
0 123 246 feet

include the use of existing available houses, motels, mobile home communities, or placing mobile homes on leased property. It is currently anticipated that an average of 400 construction contractor personnel would be housed in the offsite mancamps. The mancamps could be established on leased private or City land. Golden Valley Electric Association would provide electricity. Since the construction contractor would make its own decisions about how to house personnel off-post, this EA can only analyze generic impacts to infrastructure and socioeconomics from establishing a mancamp at an offsite location.

#### **2.3.4.1 Solid Waste Landfill Extension/Construction Debris Disposal/ Landfill Access Road**

The existing, permitted Fort Greely Solid Waste Landfill consists of five cells. Four cells are closed and a portion of the fifth cell has been opened. There is room to establish a sixth cell within the existing fenced landfill area. The current permit was issued in May 1999 and was extended to 30 July 2002. A state landfill permit may be extended for a period of up to 5 years from the date of issuance.

In order to accommodate proper disposal of solid waste from construction and operations, the Proposed Action includes expanding the existing Fort Greely Solid Waste Landfill capacity and extending the existing permit. A request for permit extension would be submitted to the state regulatory agency, in accordance with the Alaska Administrative Code (AAC), Title 18, requesting the establishment of a sixth cell within the existing landfill area. A new access road to the landfill would be sited to the east of the GBI VOC test site. An alternative to extending the existing Fort Greely landfill would be to transport solid waste to the existing North Star Landfill in Fairbanks, Alaska under agreement with local government officials.

Alternatives to expanding the existing Fort Greely Solid Waste Landfill for disposal of construction debris generated as a result of GMD VOC test construction activities would include the following:

- Use the Fort Greely burn pit to dispose of burnable waste such as paper product and wood
- Place inert construction debris such as concrete rubble on top of the existing closed cells at the Fort Greely Solid Waste Landfill in accordance with state and local requirements
- Transport debris and solid waste to the North Star Landfill
- Construct a new construction debris landfill in the vicinity of the existing landfill at Fort Greely in accordance with state and local requirements

#### **2.3.4.2 Allen Army Airfield Repair**

A potential action would involve use of Allen Army Airfield at Fort Greely such that equipment and personnel for GMD test activities could potentially be flown directly into Fort Greely thereby offering mitigation to the risk inherent in highway movement. The

airfield is currently used for existing missions and emergency civilian use, but is in a deteriorated state of repair. The main runway is 2,286 meters (7,500 feet) long and 46 meters (150 feet) wide. A project for repair of the airfield is currently programmed by the U.S. Army to bring failing portions of the airfield back to standards and useable for its existing mission and use. After those repairs are completed, use of the airfield would be a reasonable alternative to the use of Eielson AFB for movement of equipment and personnel and the construction and operation of the Eielson AFB Missile Transfer Facility discussed in section 2.2.5.

The repairs to be accomplished by the U.S. Army include repair of a 335-meter (1,100-foot) section of the runway's subgrade, and surface pavement; re-paving the rest of runway (1,981 meters [6,500 feet] with a 10-centimeter (4-inch) overlay of new asphalt, which involves excavating down 124 centimeters [49 inches] from the top of runway and rebuilding the section with 102 centimeters [40 inches] of compacted sub-base, 15 centimeters [6 inches] of drainage layer and 10 centimeters [4 inches] of new asphalt; repair of the storm water collection system; replacement of pavement markings; replacement of two deteriorated aircraft sized fuel aprons, 61 meters by 76 meters (200 feet by 250 feet); adding a 378,541-liter (100,000-gallon) aboveground fuel tank, and; replacing runway lighting for the re-paved section.

## **2.4 ALTERNATIVE GBI SITE**

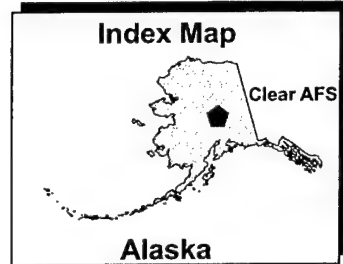
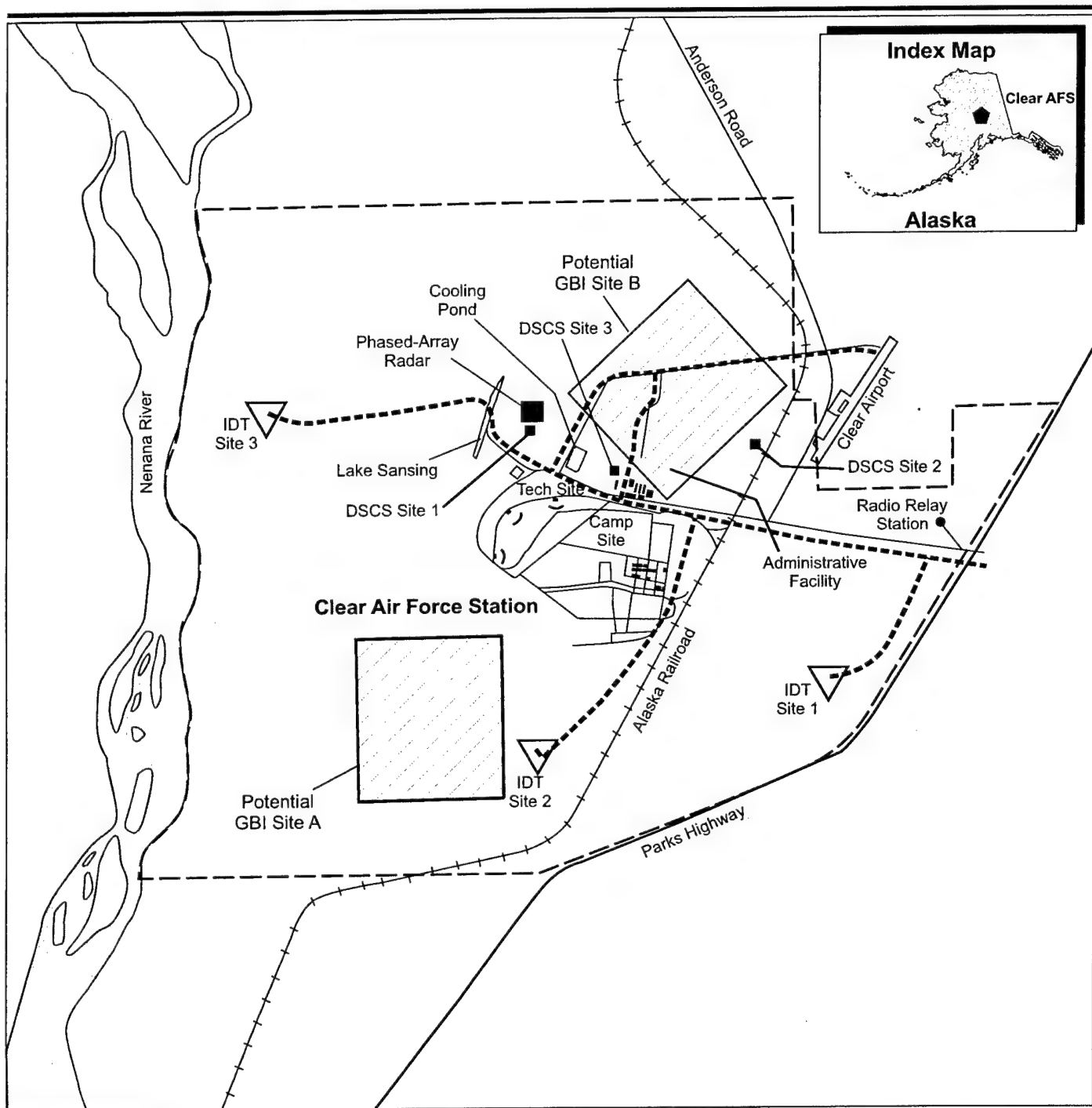
The Alternative Action would be the same as the Preferred Alternative, except the GBI VOC test site, components, and sub-components described at Fort Greely, Alaska would be constructed and operated at Clear AFS, Alaska in a similar manner.

The Alternative Action would construct and operate the GBI VOC test site at Clear AFS, Alaska, at either Site A or Site B (figure 2-14), and related support facilities at other locations as shown in table 2-4.

### **2.4.1 GROUND-BASED INTERCEPTOR**

The GBI VOC test site at Clear AFS would be constructed, configured, and operated similar to the methods described for the Preferred Alternative in section 2.3.1 and shown in figure 2-9. Figure 2-14 provides a layout of GBI VOC test facilities at Clear AFS. GBI components would be transported from the manufacturer by air to Eielson AFB and then overland by truck or rail to Clear AFS, or overland by truck or rail to Clear AFS. Table 2-5 provides a list of facility requirements for the GBI VOC test site as described and analyzed in the NMD Deployment EIS. Additional existing facilities may be required for use.

Clear Airport is a General Aviation airport that mainly serves local residents with private planes. The runway is approximately 1,219 meters (4,000 feet) long and 30 meters (100 feet) wide. (State of Alaska, 2000) No upgrades to the Clear Airport runway are planned. It would be more cost effective to construct the Missile Transfer Facility on Eielson AFB as discussed for the Preferred Alternative and transport the missiles and components by truck to the installation if this alternative is selected.



#### EXPLANATION

- Roads
- Water Area
- Installation Boundary
- Railroads
- Fiber Optic Cable (FOC) Route



0 2,500 5,000 feet  
0 762 1,524 meters

### Conceptual Layout of GBI VOC Test Facilities

Clear Air Force Station, Alaska

**Figure 2-14**

**Table 2-4: GMD VOC Alternative, One GBI Site with Six Silos**

GBI	BMC2	IDT	DSCS Terminal	Radar Support	Transportation	UEWR
Clear AFS	Clear AFS	1 at Clear AFS	1 at Clear AFS	COBRA DANE Eareckson AS	Missile Transfer Facility at Eielson AFB	Beale AFB
	Peterson AFB, Shriever AFB, Cheyenne Mountain Complex, Boeing Facilities, Beale AFB, and Eareckson AS	1 at Eareckson AS	2 co-located at Eareckson AS			

**Table 2-5: GMD Facility Requirements, Clear AFS, Alaska as Described in the NMD Deployment EIS**

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	870—Open Storage
Interceptor Receiving and Processing Facility	1, 3, 4, 26, 29, 35, 37, 40, 41, 42, 43, 48, 50, 51, 62, 65, 66, 79, 80, 82, 93, 720—Buildings and adjacent area known as Construction Camp
Interceptor Storage Facilities	
Headquarters Facility	251—Fire Station
Silo Interface Vault	100, 150, 196, 200-204, 209, 250, 280
Mechanical/Electrical Equipment Building	
Administration and Maintenance Facility	
Backup Power Generation with Fuel Storage	
Security (Fencing, Lighting, Monitoring Equipment)	
Equipment/Vehicle Storage Facilities	
Helicopter Pad	
Sewage Treatment (Septic Field)	
Housing/Dormitory/Dining	
Steam Plant	
Substation	
Readiness Station	
Security Building	
Warehouse	
Entry Control Station	
Roads/Utility Extensions/Water Wells	
Community Center	
Fuel Unloading Facility	
Water Supply Facility	

## **2.4.2 BMC3**

The IDT and DSCS earth terminal at Clear AFS would be constructed, configured, and operated in the same manner as described for Fort Greely section 2.3.2 and shown in figures 2-2 through 2-4. Figure 2-14 shows the potential locations of BMC3 facilities at Clear AFS.

### **2.4.2.1 BMC2**

A BMC2 Element Site Communication Node would be located at the GBI VOC test site on Clear AFS.

### **2.4.2.2 IDT**

One IDT site would be constructed and operated at Clear AFS to support the GBI VOC test site activities. Site 3 is the preferred site (shown on figure 2-14). Two alternate IDT sites were identified during the siting process. Primary power for the IDT at Clear AFS would be supplied by the existing Clear AFS power plant.

### **2.4.2.3 GMD Communication Network**

The GCN sub-component would include one remotely controlled DSCS and the FOC required to link the components of the GMD test activities.

## **DSCS**

### **Construction**

One DSCS earth terminal would be constructed and operated at Clear AFS to support the GBI VOC test site activities. The preferred location, Site 1, is within the south side of the fence line (see figure 2-14). Two alternate DSCS sites were identified during the siting process. Water and sewer service would be provided to the DSCS earth terminal.

### **Operation**

The DSCS terminal would be an unmanned facility that would require no permanent onsite support personnel. Personnel would only be required during tests or during maintenance periods. The DSCS would provide satellite communications among Eareckson AS, Clear AFS, and the BMC2 Command Nodes during GMD testing.

## **Fiber Optic Cable**

### **Construction**

The proposed FOC routes to support the GMD test activities at Clear AFS are shown in figure 2-14. However, FOC would only be constructed where the DSCS and IDT are sited and existing FOC would be used whenever possible.

## **Operation**

The FOC network would provide the communications link between the components and sub-components of the GMD test sites.

### **2.4.3 MANCAMP, HOUSING, AND ADMINISTRATIVE SUPPORT FACILITIES**

Currently, the requirements for a mancamp, housing, and administrative support facilities for GBI VOC test site activities at Clear AFS have not been validated. If required, a mancamp for construction contractors would be temporary and established approximately in the center of the installation as indicated in figure 2-14. It would be designed similar to the Fort Greely mancamp described in section 2.3.4 and shown in figure 2-14 and would house the same number of personnel.

Housing and administrative support facilities (office and storage space) would also potentially be constructed or brought in (e.g. trailers or portable buildings) and located as indicated in figure 2-14. Existing facilities could potentially be modified and satisfy some or all of the administrative support facilities requirements.

The mancamp, housing, and administrative support facilities would be established in previously disturbed areas. Utilities would be provided from on-base resources. The mancamp area would be fenced and gated with controlled access to restrict entry.

## **2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR FURTHER ANALYSIS**

### **Alternative to GBI VOC Test Site**

The NMD Deployment EIS analyzed Fort Greely, Clear AFS, and the Yukon Training Area as reasonable alternatives for a deployed GBI that would maximize NMD performance. According to the NMD Deployment EIS, the Yukon Training Area is incompatible with the NMD, now GMD, action due to mission conflicts. Consequently, only Fort Greely and Clear AFS remain reasonable alternatives for a deployed GMD that could effectively defend all 50 states from a limited ballistic missile attack.

### **Alternative Missile Transfer Facility Site**

There are two viable military airfields in the vicinity of the proposed GBI VOC sites: Eielson AFB and Fort Greely. Due to security and safety concerns caused by the potential requirement for temporary storage at/near the point of disembarkation of the missiles from the plane, the commercial airport adjacent to Clear AFS and the commercial airport at Fairbanks were not considered for analysis. In addition, the runway at the commercial airport adjacent to Clear AFS is too short to support aircraft required to transport the GBIs; modifying this runway would require significantly more work than would modifying the runway at Fort Greely, and was not considered to be a reasonable alternative.

### **Alternative UEWB Sites**

Beale AFB is one of only three operating EWRs sites in the United States; the other two are Cape Cod AFS in Massachusetts and Clear AFS in Alaska. The Beale EWR was sited at its current location to maximize the ability to perform critical defense missions, including acquisition and tracking of ballistic missiles aimed at the United States. The location of the Beale EWR on the west coast makes it the only EWR that can track GMD test activities launched from the presently existing test facilities in the Pacific. The Beale EWR and COBRA DANE Radar site are not reasonable alternatives to each other, as each radar performs a different function in validating the GMD operational concept. Constructing a new radar at some different location that could perform this function in the test bed would create more impact to the environment than would using the existing facility, and would be extremely expensive. For these reasons, no reasonable alternatives to use of the Beale EWR were identified.

### **Alternative to COBRA DANE Radar Site**

The location of the COBRA DANE radar provides the potential to test the BMC3 portion of the GMD element using real-time, real-world targets of opportunity, such as foreign test launches that are within the radar's field of view. This would test the ability of the BMC3 to integrate and effectively use real-world data processed by the upgraded COBRA DANE as part of the GMD VOC test bed. There are no other comparable radars in the northwest Pacific region that can perform this function. The Beale EWR and COBRA DANE Radar site are not reasonable alternatives to each other, as each radar performs a different function in validating the GMD operational concept. Constructing a new radar at a different location that could perform this function in the test bed would create more impact to the environment than would using the existing facility, and would be extremely expensive. For these reasons, no reasonable alternatives to use of the COBRA DANE Site were identified.

## **2.6 NO-ACTION ALTERNATIVE**

Under the No-action Alternative, the GMD VOC test site would not be established, the GMD and its components could not be tested under operationally realistic conditions, and prove-out of interoperability functions could not be accomplished.

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## **3.0**

# **AFFECTED ENVIRONMENT**

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## **3.0 AFFECTED ENVIRONMENT**

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This section describes the environmental characteristics that may be affected by the Proposed Action. The information provided serves as a baseline from which to identify and evaluate environmental changes resulting from the construction and operation of the components of the proposed GBI VOC test site. To provide a baseline point of reference for understanding any potential impacts, the affected environment is briefly described; any components of greater concern are described in greater detail.

Proposed BMC2 activities at Peterson AFB, Shriever AFB, and Cheyenne Mountain Complex, and the Boeing facilities would consist of placing computer and communication equipment within an existing room, which may require minor interior modifications only and for that reason no affected environment is presented. Appropriate health and safety and hazardous materials and waste management regulations would be followed during any modifications; therefore, no impacts are anticipated.

Available reference materials, including EAs, EISs, and base master plans, were acquired to assist in the description of the affected environment. To fill data gaps (questions that could not be answered from the literature) and to verify and update available information, installation and facility personnel; Federal, state, and local regulatory agencies; and private individuals were contacted.

### **Environmental Resources**

Thirteen broad areas of environmental consideration were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise, socioeconomics, water resources, and environmental justice. The areas were analyzed as applicable for each proposed location or activity.

The following sections summarize applicable data from the NMD Deployment EIS. Information from any other source is specifically referenced.

### **3.1 FORT GREELY, ALASKA**

Fort Greely is located approximately 172 kilometers (107 miles) southeast of Fairbanks and just south of the community of Delta Junction in an unincorporated borough. Fort Greely originally contained 267,519 hectares (661,051 acres), most of which was withdrawn from the Bureau of Land Management. Fort Greely consists of the Main Post, two large training areas—Fort Greely West Training Area and Fort Greely East Training Area—and three outlying sites in the area.

Approximately 722 hectares (1,785 acres) of Fort Greely was surplused in July 2001. This area contained most of the buildings on the base. (Moniz, 2001) However, Section 1207 of Public Law 107-20 authorized the Secretary of Defense to retain all or a portion of Fort Greely to meet military, operational, logistics, and personnel support requirements for missile defense. The Secretary of Defense delegated this authority to the Director of MDA, who requested retention of the property to meet support requirements for missile defense. The U.S. Army amended the previously approved Determination of Surplus as a result of the realignment of Fort Greely on 8 November 2001. MDA has assumed all operational costs associated with the requested property. Use of the property must be coordinated and agreed to by the U.S. Army Pacific Command.

Initial analysis indicated that the activities proposed for Fort Greely would not result in short- or long-term impacts to airspace. No new special use airspace, or any modification to existing special use airspace, would be required to support any of the proposed activities.

### **3.1.1 AIR QUALITY**

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere, expressed in units of parts per million (ppm) or micrograms per cubic meter. Pollutant concentrations are determined by the type and amount of pollutants emitted into the atmosphere; the physical characteristics, including size and topography of the air basin; and meteorological conditions related to prevailing climate. The significance of a pollutant concentration is determined by comparison with National Ambient Air Quality Standards (NAAQS) and state ambient air standards that establish limits on the maximum allowable concentrations of seven pollutants (carbon monoxide, lead, oxides of nitrogen, ozone, particulate matter with a diameter less than or equal to 10 micrometers [PM-10], particulate matter with a diameter less than or equal to 2.5 micrometers, and sulfur dioxide) to protect public health and welfare.

Alaska has established State Ambient Air Quality Standards. Emissions of air pollutants from operations in Alaska are limited to the more restrictive standard (Federal or state).

### **Region of Influence**

Identifying the region of influence (ROI) for air quality assessment requires knowledge of the pollutant types, source emissions rates and release parameters, proximity relationships of project emission sources to other emission sources, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone and its precursors, nitrogen oxide and reactive organic compounds), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source. Wind speeds average approximately 18 kilometers (11 miles) per hour and are generally southerly along the Delta River in the summer.

## **Affected Environment**

Interior Alaska has a continental or subarctic climate characterized by long, cold winters; short, mild summers; and significant changes in the daily pattern throughout the year.

### *Regional Air Quality*

Air quality in Alaska is generally very good; however, two carbon monoxide nonattainment areas are located in and around urban areas of Anchorage and Fairbanks. Since Fort Greely is approximately 172 kilometers (107 miles) southeast of Fairbanks it is removed from many of the sources that disrupt air quality in the Fairbanks region. Principal sources of air pollution in the Fort Greely area are from limited vehicle traffic and fuels burned for heat and/or power. The overall air quality is good, and the area is in attainment for all NAAQS and state standards.

Although the base itself is located in an attainment area, the Fairbanks North Star Borough is in nonattainment for carbon monoxide. During episodes of cold winter weather, atmospheric inversions may trap contaminants and cause exceedances of the NAAQS or state standards. According to Fairbanks North Star Borough studies, approximately 90 percent of all carbon monoxide produced within the borough is from vehicles.

Pollutants from mobile sources would include hydrocarbons, carbon monoxide, nitrogen oxides, and particle emissions. The primary pollutant of concern from mobile sources in Alaska is carbon monoxide. As such, this is the only pollutant from mobile sources analyzed in the NMD Deployment EIS and this study. Up to 80 percent of carbon monoxide emissions contributing to exceedances of the NAAQS in Fairbanks have been attributed to mobile sources. Cold starts during moderately cold weather, prolonged idling periods, and low-level temperature inversions all contribute to pronounced air quality impacts from motor vehicle emissions in cold climates.

### *Existing Emissions Sources*

Fort Greely has major emissions sources from boilers, generators, storage tanks, prescribed burning/firefighter training and has submitted an application for a Title V Air Permit to the ADEC (Spiers, 2001a). Annual emissions (1997) included the following: carbon monoxide—3,327 metric tons (3,668 tons); oxides of nitrogen—124 metric tons (136 tons); and volatile organic compounds—37 metric tons (41 tons). Fort Greely also emitted 0.27 metric tons (0.30 tons) of hazardous air pollutants. As such, Fort Greely is not a major source of hazardous air pollutants.

## **3.1.2 BIOLOGICAL RESOURCES**

Native or naturalized vegetation, wildlife, and the habitats in which they occur are collectively referred to as biological resources. Existing information on plant and animal species and habitat types in the vicinity of the proposed sites was reviewed, with special emphasis on the presence of any species listed as threatened or endangered by Federal or state agencies, to assess their sensitivity to the effects of the Proposed Action. For the

purpose of discussion, biological resources have been divided into the areas of vegetation, wildlife, threatened and endangered species, and environmentally sensitive habitat.

### **Region of Influence**

The ROI for biological resources includes the area within and adjacent to the sites on Fort Greely that could potentially be affected by construction or operation of the proposed activities.

### **Affected Environment**

#### *Vegetation*

In June 1999, a wildfire burned through the area, and as a result, much of the vegetation within the base was burned. Approximately 54 hectares (134 acres) of the area proposed for use underwent initial site preparation activities in late 2001 including vegetation removal and initial earthwork related to site and road grading.

The predominant vegetation (figure 3-1) at the proposed sites is low growing spruce forest, which is common throughout Interior Alaska. At Fort Greely, approximately one-third of the base is lowland black spruce interspersed with about 40 percent heath bog communities. Dominant tree species are black spruce and balsam poplar. The understory and groundcover consist of *Vaccinium* spp., marsh labrador tea, crowberry, and a variety of mosses and lichens.

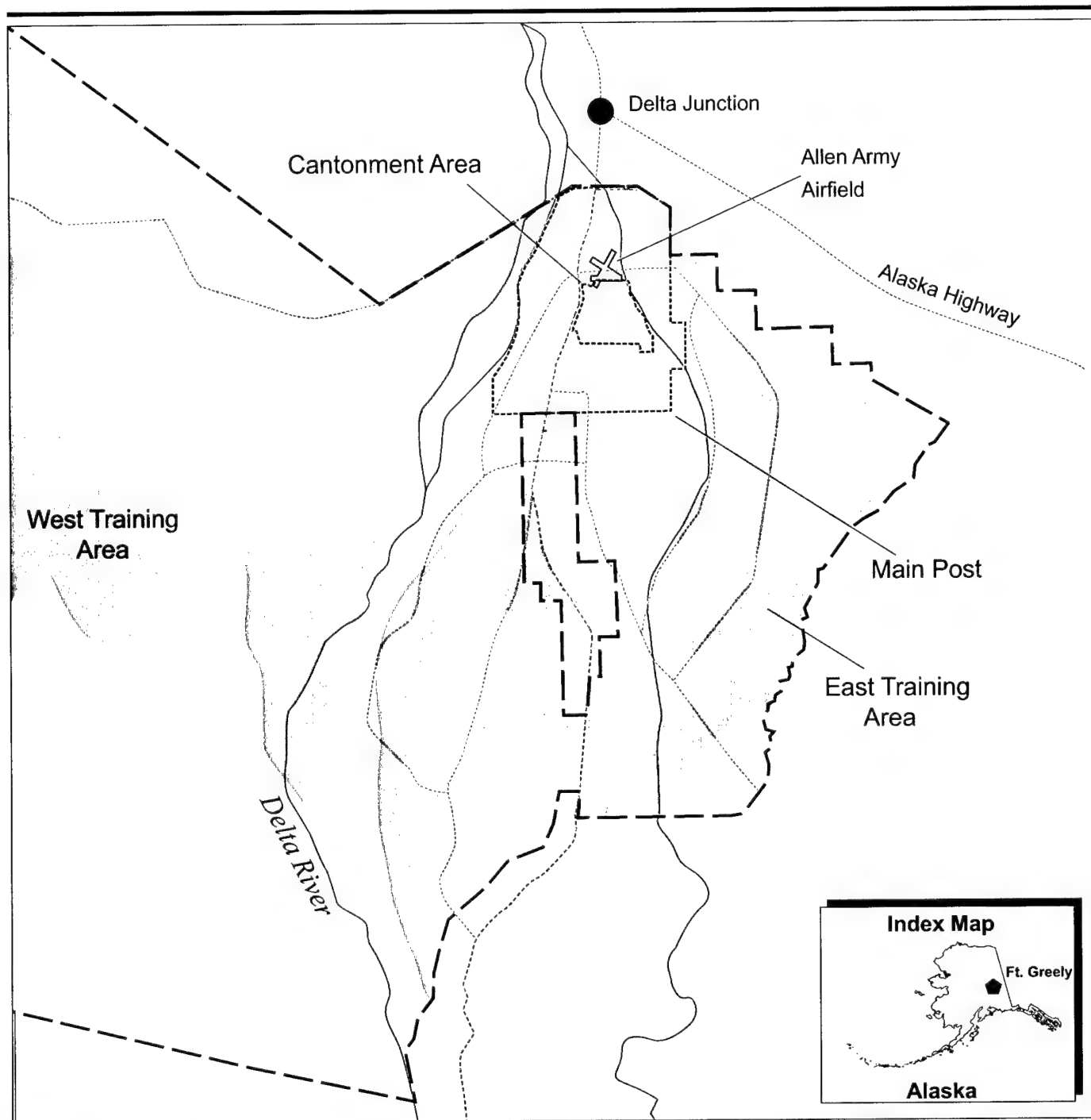
Native vegetation was removed from most of the cantonment area during the 1950s. The area has been landscaped and is maintained by mowing. A few isolated pockets of forest do remain, particularly north of the airfield.

#### *Wildlife*

Numerous lakes and ponds and four glacially fed major streams are located on Fort Greely. The major streams flow north to the Tanana River, but are silt laden and do not provide quality habitat for fish although Arctic grayling migrate through them. No important spawning (anadromous) streams are located on the installation.

Fort Greely supports the largest number of game species found at any military installation within the United States. The most common big game species include moose, bison, and barren ground caribou.

Commonly occurring predators in the project area include grizzly bear, black bear, gray wolf, red fox, marten, coyote, and wolverine. Additional species trapped for fur at Fort Greely are mink, muskrat, snowshoe hare, beaver, and red squirrel. The cantonment area at Fort Greely does not provide quality wildlife habitat compared to the surrounding undeveloped areas. Resident wildlife is limited to small rodents and bats. Avian species occurring within the project areas include the common raven, willow ptarmigan, rock ptarmigan, spruce grouse, ruffed grouse, owls, and a variety of songbirds.



#### EXPLANATION

- |  |                        |  |                      |
|--|------------------------|--|----------------------|
|  | Roads and Major Trails |  | Mixed Forest         |
|  | Rivers                 |  | Tundra/Barren        |
|  | Installation Boundary  |  | Coniferous           |
|  | Trans-Alaska Pipeline  |  | Deciduous/High Brush |
|  | Cantonment Area        |  | Muskeg               |
|  | Main Post Boundary     |  | City                 |

Scale 1:500,000



0 4 7.9 miles  
0 6.4 12.7 kilometers

#### Vegetation

Fort Greely, Alaska

Figure 3-1

### *Threatened and Endangered Species*

No federally listed threatened, endangered, or candidate species of vegetation are found in Interior Alaska.

No known threatened or endangered wildlife species occur on Fort Greely. Although the recently delisted American peregrine falcon and arctic peregrine falcon migrate through the area during the spring and fall migration periods, there have been no confirmed sightings of either species within 16 kilometers (10 miles) of Fort Greely.

### *Environmentally Sensitive Habitat*

No federally designated critical habitat has been identified on Fort Greely.

Wetlands in Alaska are defined by the U.S. Army Corps of Engineers as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." The U.S. Army Corps of Engineers Alaska District and EPA regulate wetlands through the Clean Water Act Section 404 Permitting Program. There are no wetlands within the areas proposed for ground disturbance. The nearest wetland as shown in figure 3-2 is a palustrine, scrub-shrub, needle-leaved evergreen, saturated wetland approximately 457 meters (1,500 feet) east of the proposed GBI VOC site. (National Wetlands Inventory, 2001)

## **3.1.3 CULTURAL RESOURCES**

Cultural resources include prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For ease of discussion, cultural resources have been divided into archaeological resources (prehistoric and historic), historic buildings and structures, native populations/ traditional resources (e.g., Native American sacred or ceremonial sites), and paleontological resources.

Numerous laws and regulations require that possible effects to cultural resources be considered during the planning and execution of Federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the Federal agency proposing the action, and prescribe the relationship among other involved agencies (e.g., State Historic Preservation Officer [SHPO], the Advisory Council on Historic Preservation). In addition to NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (especially Sections 106 and 110), the Archaeological Resources Protection Act, the Antiquities Act of 1906, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.



#### EXPLANATION

- Uplands
- Wetlands
- Private Property
- Roads
- Fort Greely Boundary
- IDT Sites



Scale  
0 571.5 1,143 meters  
0 1,875 3,750 feet

#### Wetlands, Potential GBI VOC Site

Fort Greely, Alaska

**Figure 3-2**

## **Region of Influence**

The term ROI is synonymous with the "area of potential effect" as defined under cultural resources regulations, 36 Code of Federal Regulations (CFR) 15 Part 800.16(d). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. The currently defined ROI for Fort Greely includes construction sites and any other areas where ground disturbance could occur (e.g., utility corridors, roads, or runway modifications).

## **Affected Environment**

### *Prehistoric and Historic Archaeological Resources*

Archaeological evidence indicates that the Fort Greely area has been occupied for 10,000 to 12,000 years. Eighty-four prehistoric archaeological sites have been identified on Fort Greely. Sites are found in every vegetative community and predominantly west of the Delta River out of the ROI. Most of the sites are surface flake scatters, isolated artifacts, or are found in a disturbed context and contain insufficient information to determine site function, affiliation, or age.

In 1997, the Bureau of Land Management and the U.S. Army Corps of Engineers, Alaska District conducted a survey of the Base Realignment and Closure cantonment area (including the runway area). Due to a lack of subsurface artifacts, the area is considered clear of cultural resources concerns. However, there could be additional archaeological resources in the Fire Tower Hill area of the cantonment.

There are no recorded sites within the proposed GBI area (figure 2-9); and due to the degree of disturbance to the area and the physiographic setting within which the GBI area occurs, the potential for archaeological materials is considered low. An archaeological survey of the Fort Greely ROI performed in August 1999 confirmed this assumption. Recent use sites (i.e., less than 50 years in age) are associated with contemporary hunters, trappers, and the military. None of these display sufficient significance or integrity to be considered eligible for listing in the National Register. SHPO concurrence is pending.

### *Historic Buildings and Structures*

Fort Greely originated as Station 17, Alaskan Wing, Air Transport Command in 1942. During World War II, the installation served as a rest and refueling stop for American pilots. In 1949, the installation became the site of the Arctic Training Center, due to extreme winter conditions and varied terrain. Construction began on permanent buildings to support cold weather testing and training (in the area now known as the Main Post) in 1953, and the installation had been renamed Fort Greely by 1955.

As a result of archaeological investigations, three historic sites and a historic trail have been identified at Fort Greely—all are west of the Delta River outside the ROI.

Review of the World War II and Cold War inventory of Fort Greely by the Alaska SHPO and subsequent consultation between the U.S. Army and the SHPO indicates that there are 26 buildings and structures eligible for listing in the National Register. A Memorandum of Agreement between the U.S. Army and the Alaska SHPO regarding these buildings has been completed. The Memorandum of Agreement stipulated that all of the buildings within the district "may be altered, demolished, leased with no restrictions, or transferred out of federal ownership with no restrictions" following completion of Historic American Buildings Survey (HABS) Level 1 recordation. All HABS information has been delivered and the Memorandum of Agreement between SHPO and the U.S. Army has been signed. (Spiers, 2001a)

#### *Native Populations/Traditional Resources*

Fort Greely encompasses lands historically and prehistorically occupied by the Tanana Indians. Salcha Natives used the Delta River and Delta Creek for subsistence hunting in historic times; however, this generally ceased by the 1920s. By 1962 there were no native settlements in the Tanana Valley between Healy Lake and Nenana.

No Alaska Native traditional cultural properties have been formally identified within the ROI. In addition, no Alaska Native reservations or villages are in the immediate vicinity of Fort Greely. Tanana is the closest Alaska Native village, approximately 130 kilometers (80 miles) east of Fort Greely.

#### *Paleontological Resources*

The ROI at Fort Greely is situated within an alluvial fan, characterized by glacial till; portions of the ROI are also underlain by permafrost. Although the bones of Ice Age mammals have been found elsewhere on the installation, no paleontological remains have been encountered within the ROI.

### **3.1.4 GEOLOGY AND SOILS**

Geology and soils include those aspects of the natural environment related to the earth, which may affect or be affected by the Proposed Action. These features include physiography, geologic units and their structure, the presence/availability of mineral resources, soil condition and capabilities, and the potential for natural hazards.

#### **Region of Influence**

The ROI for geology and soils includes that area that could potentially be disturbed by construction and operation activities associated with the GBI field, BMC3, related facilities, and connecting roads and infrastructure.

#### **Affected Environment**

##### *Physiography*

The Fort Greely cantonment area encompasses a portion of Tanana-Kuskokwim Lowlands physiographic province. Streams flowing through the foothills generally originate in the

Alaska Range and flow north in rugged V-shaped canyons and across broad terraced valleys. Fort Greely is situated between two significant drainages originating in the foothills—the Delta River to the west and Jarvis Creek to the east. The terrain at the site is mildly undulating with elevations ranging from approximately 411 to 442 meters (1,350 to 1,450 feet). The site vicinity has a northeast surface gradient of about 18 meters (60 feet) per mile.

### *Geology*

The proposed GBI VOC site, like the cantonment area, is located on a low alluvial terrace that has a gently undulating surface. The terrace is composed of glacial outwash deposits that are underlain by till, which is in turn underlain by stratified gravel. Moraine features to the east and south of the cantonment are composed of coarse, unstratified, unsorted till ranging from silty gravel with sand to sandy silt with gravel.

Wind blown loess of glacial origin forms a mantle over much of the Fort Greely area, ranging from several centimeters thick to greater than 1.5 meters (5 feet) thick. Discontinuous permafrost occurs throughout the region. The permafrost ranges from the surface to as much as 66 meters (217 feet) below ground surface.

### *Soils*

No detailed soil surveys have been completed for the site area. Shallow, well-drained silt loams with sandy to gravelly underlying material occupy most of the rolling uplands on the surface of the glacial moraines and alluvium east of the Delta River. The exact thickness and areal extent of these soils at the site are unknown.

### *Mineral Resources*

The U.S. Department of the Interior and DoD considered Fort Greely to have low to moderate potential for leasable minerals. Eight mineral material sites, all of which are now closed or inactive, have been located at Fort Greely. Other gravel pits are located near Fort Greely along the Richardson Highway and the Trans-Alaska Pipeline System.

### *Geologic Hazards*

Fort Greely lies in seismic Zone 3, where major earthquake damage has a 10 percent probability of occurring at least once in 50 years. Earthquake epicenters are scattered throughout Fort Greely and surrounding areas. From past studies there appears to be no concentration of seismic events in the area, and serious damage has not been reported.

Permafrost was not encountered within test borings conducted at the proposed GBI site in 1999, nor did ground penetrating radar indicate any ice lenses or other permafrost features.

### 3.1.5 HAZARDOUS MATERIALS AND WASTE

The relevant aspects of hazardous materials/waste management include the applicable regulatory procedures for hazardous materials usage and hazardous waste generation, and management programs for existing hazardous waste-contaminated sites within areas potentially affected by the Proposed Action.

Hazardous materials and hazardous waste management activities are governed by specific environmental regulations. Any hazardous materials and waste management plans applicable to the proposed activities that have lapsed since realignment would be updated and reinstated. For the purposes of the following analysis, the terms hazardous materials or hazardous waste will mean those substances defined by both Federal and state regulations. In general, this includes substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment when released into the environment. Hazardous waste is further defined as any solid waste that possesses any of the hazard characteristics of toxicity, ignitibility, corrosivity, or reactivity.

#### **Region of Influence**

The ROI for hazardous materials and hazardous waste management includes the Fort Greely infrastructure and existing facilities within the main base cantonment. Additional facilities associated with the Proposed Action could be constructed within the base cantonment area.

#### **Affected Environment**

##### *Hazardous Materials Management*

A Hazardous Waste and Hazardous Materials Standard Operating Procedure Manual created for Fort Greely in September of 1995, complies with all applicable state and Federal regulations. The Plan established standard operating procedures for the correct management and storage of hazardous materials. Hazardous material inventories are reviewed and updated twice a year if necessary.

Hazardous materials previously stored within the cantonment area include fuels, pesticides, and materials used in vehicle, boat, and aviation repair; power and heat generation; wastewater treatment; photo processing; and building maintenance.

Currently, Fort Greely has 49 ASTs with capacities ranging from 946 to 2,384,809 liters (250 to 630,000 gallons). Four ASTs located within the cantonment area were emptied, purged of fumes, and secured before realignment (Spiers, 2001a). The tanks and their supports are periodically inspected using visual inspection, hydrostatic inspection, or a system of nondestructive shell thickness testing. There are 23 underground storage tanks (USTs) at Fort Greely, 9 in the cantonment area, with capacities ranging from 1,136 to 189,270 liters (300 to 50,000 gallons). USTs located within the cantonment area that meet state regulations would be removed unless identified to support specific reuse

activities. USTs that do not meet current regulations will be deactivated and removed before disposal by deed.

Fort Greely administers an Oil Discharge Prevention and Contingency Plan, which leads personnel through procedures necessary to safely detect, contain, and clean up all oil spill discharges on post. Also, a Storm Water Pollution Prevention Plan (SWPPP) for Fort Greely was completed in May 1996. The plan includes site-specific good housekeeping practices, facility surveys, satellite accumulation area inspections, employee training, record keeping and internal reporting, comprehensive site compliance evaluation, and sediment and erosion control. The base also complies with applicable reporting requirements by submitting annual emergency response and extremely hazardous substances updates to the local emergency management officials.

### *Hazardous Waste Management*

Fort Greely is registered by the EPA as a small quantity generator. Hazardous wastes generated at the installation are associated with equipment maintenance. Other wastes generated by the facility include paint, pesticides, aerosol canisters, batteries, used acetone and paint thinner, and sewage sludge. The wastes are accumulated in 208-liter (55-gallon) drums at satellite accumulation points before disposal. Currently, a temporary unnumbered building near T100 serves as the centralized hazardous waste collection site (Spiers, 2001a). Hazardous waste management is performed in accordance with a Hazardous Waste and Hazardous Materials Standard Operating Procedures Manual.

### *Pollution Prevention*

Fort Greely has developed and implemented a Pollution Prevention Plan. This plan aids in the elimination or reduction of hazardous substances, pollutants, and contaminants. Recycling activities at Fort Greely include fuels, batteries, and brass shell casings.

### *Installation Restoration Program*

No Installation Restoration Program (IRP) sites on Fort Greely have been listed on the Comprehensive Environmental Response, Compensation, and Liability Act National Priorities List. In addition, there are no leaking UST sites on the installation.

Three buildings within the cantonment area are on the State Priorities List. These include Building 612, where waste drains to the sanitary sewer; Building 601, where transformers, solvents, and herbicides have been stored in the Resource and Utilities yard north of the building; and Building 605, which includes a maintenance shop, paint bay, and battery storage facility. All three of these buildings are potential GMD VOC support facilities.

Environmental cleanup at Fort Greely has been addressed under both the IRP and the Base Realignment and Closure Environmental Cleanup Program. Numerous sites have been investigated and remediated under these programs. Investigations are now complete at all known sites. Cleanup of the nuclear waste line from the past activities of the SM-1A nuclear reactor has been completed, and other cleanup actions at Building 110 and the old firefighter training pits are currently underway. Building 101 and several other sites are

being characterized for the extent of contamination and scheduled for cleanup. (Spiers, 2001b)

#### *Asbestos*

Most of the family housing unit basements surveyed in 1998 were found to contain asbestos in pipe fittings and pipe insulation. The main post Fire Station, Building 504, was also tested in 1988 and found to contain asbestos in the pipe insulation. Buildings constructed before 1985, which have not been surveyed, have been identified as at risk for the presence of asbestos-containing material.

#### *Polychlorinated Biphenyls*

All polychlorinated biphenyl (PCB)-containing transformers were removed from the installation in 1994.

#### *Lead-based Paint*

All family housing, medical center, and transient quarters buildings surveyed in 1997 were found to contain lead-based paint. Buildings not surveyed but constructed before 1978 are believed to be at risk for the presence of lead-based paint.

#### *Radon*

Radon surveys were conducted in various buildings within the cantonment area from 1990 through 1993. Buildings within the cantonment area have been evaluated for the presence of radon based on the results of those surveys. Some buildings were found to have radon concentrations equal to or greater than the current U.S. EPA guidelines of 4 picocuries per liter. Family housing units with radon levels greater than or equal to 4 picocuries per liter have been mitigated. All buildings not surveyed were designated as potentially containing radon, and buildings found to contain radon concentrations below 4 picocuries per liter were not given a radon designation.

#### *Pesticides*

Fort Greely has completed and implemented an Integrated Pest Management Plan to minimize the adverse environmental impact of pesticide use while achieving an acceptable level of control and cost-effectiveness. All chemicals used on Fort Greely are EPA approved and are applied by DoD management certified personnel.

### **3.1.6 HEALTH AND SAFETY**

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following:

**The well-being, safety, or health of workers**—Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.

**The well-being, safety, or health of members of the public**—Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-base population. Also included within this category are hazards to equipment, structures, flora, and fauna.

### **Region of Influence**

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities. The ROI for public safety includes properties immediately adjacent to the base and the transportation network for hazardous materials.

### **Affected Environment**

The Fort Greely cantonment area has been given over for MDA use; therefore, most of the operations in this area have ceased. However, the base still maintains maintenance personnel and firefighting support for the cantonment area. The Fort Greely fire department maintains four crash/pumper trucks, three brush trucks, one small pumper truck, and a command vehicle. The base fire department is authorized for one chief, two captains, and nine firefighters. To assist in emergency response, Fort Greely maintains cooperative agreements with most of the small communities within a 161-kilometer (100-mile) radius of the base. The Bureau of Land Management has the primary responsibility of fighting fires in the forested area of Fort Greely with assistance from the post fire department (Spiers, 2001a).

Fort Greely has an airfield; however, this field is only minimally used for training. The Clear Zones for the airfield are contained within the base boundaries.

Health and safety issues at Fort Greely are associated with both U.S. Army and U.S. Air Force activities and range fires. The U.S. Army trains at Fort Greely throughout the year with exercises including the deployment of troops, weapons firing, and infantry tactical maneuvers. Weapons such as rockets, mortars, small arms, and artillery are fired from the east side of the Delta River westward towards weapon impact areas. Access to the weapon impact areas on Fort Greely is restricted because of the potential of unexploded ordnance. The Fort Greely East Training Area is used primarily as a nonfiring maneuver area. The Cold Regions Test Center utilizes this same area for experimental airdrops, airborne training, and testing of clothing, vehicles, and equipment.

The U.S. Air Force uses the airspace above Fort Greely and the weapons impact areas for training activities such as close air support, aerial gunnery, rockets, bombing, training flights, and test flights. These activities are conducted within the restricted airspace or along military training routes above Fort Greely in accordance with U.S. Air Force safety procedures.

Under a Memorandum of Understanding, the Bureau of Land Management Alaska Fire Service is responsible for fire detection and suppression on withdrawn lands. The Alaska

Fire Service has a reciprocal Fire Protection Agreement with the State of Alaska, Department of Natural Resources, Division of Forestry. Nineteen fires of 40 hectares (100 acres) or more occurred on Fort Greely from 1954 to 1997. The U.S. Army Alaska requires a 15-meter (50-foot) firebreak around all facilities.

### **3.1.7 INFRASTRUCTURE**

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

#### **Region of Influence**

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

#### **Affected Environment**

##### *Water*

The potable water supply at Fort Greely is currently managed from Building 606, the power plant. Two groundwater wells are utilized to supply all of the existing building facilities and fire hydrants within the main cantonment. These two wells have a combined capacity of 4.2 million liters per day (1.1 million gallons per day). A 712-thousand-liter (188-thousand-gallon) storage tank is located in Building 606 and feeds two 76-thousand-liter (20-thousand-gallon) pressure tanks that pump into a piped water system. The only water treatment performed is the addition of chlorine and fluorine. The existing base water system, when all buildings were in use, consumed roughly 1 million liters per day (0.3 million gallons per day). Two new 1,893-liter- (500-gallon-) per-minute wells were developed during initial site preparation activities.

##### *Wastewater*

The sewage system at Fort Greely conveys wastewater to an Imhoff (septic) tank inside Building 633. Sludge from the bottom of this tank is pumped to sludge drying beds. Once the sludge is dried, it is hauled to the landfill. Effluent from the Imhoff tank is conveyed to the sewage lagoon. The lagoon is aerated for further treatment. Effluent leaving the sewage lagoon is chlorinated and discharged to Jarvis Creek.

This system has a capacity of 1.7 million liters per day (0.46 million gallons per day). Wastewater usage, when all buildings were in use, was less than 1.2 million liters per day (0.32 million gallons per day). Wastewater from buildings in the Old Post and Mid Post area is discharged to either a septic tank or a leach field.

##### *Solid Waste*

The base landfill is a Class II facility that is currently permitted to receive both sewage sludge and asbestos materials. An Alaska Class II Municipal Solid Waste Landfill is a landfill that accepts, for disposal, less than 20.3 metric tons (20 tons) daily of municipal

solid waste based on an annual average; is located on a site where there is no evidence of groundwater pollution caused or contributed to by the landfill; is not connected by road to a Class I facility or, if connected by road, is located more than 80 kilometers (50 miles) from a Class I facility; and serves a community that experiences, for at least 3 months each year, an interruption in access to surface transportation, preventing access to a Class I landfill; or with no practicable waste management alternative, with a landfill located in an area that annually receives 64 centimeters (25 inches) or less of precipitation.

The current facility is not lined, but does have groundwater monitoring tubes. Cells at this facility are about 18 meters (60 feet) by 61 meters (200 feet) by 6 meters (20 feet) deep and generally last 1.5 years under current conditions. Current solid waste management operations consist of solid waste collection, volume reduction by open pit burning, and final disposal (including ash) in the landfill. Open burning is conducted about once a week in a burn facility located away from the working face and not inside the landfill boundary. Gravel is utilized for daily cover at the working face of the landfill.

The Fort Greely per capita solid waste generation rate in 1995 was estimated to be about 1.8 kilograms (4 pounds) per person per day. In 1999, approximately 13,494 cubic meters (17,649 cubic yards) of solid waste were generated at Fort Greely. Open burning operations are conducted at Fort Greely, authorized under the current permit. Burning is conducted in a burn facility located away from the working face and not inside the landfill boundary, and is limited to wood, paper, and cardboard which do not create black smoke or smoldering of waste.

#### *Electricity and Steam*

Electrical power requirements at Fort Greely are currently met through a combination of power supplied from Fort Wainwright and on-post generators run by Fort Greely personnel. The electrical power from Fort Wainwright is "wheeled" over the commercial electrical grid that exists between the two bases and is eventually supplied to Fort Greely through an existing 2.9-MW substation. The U.S. Army Alaska pays Golden Valley Electric Association for the use of its grid. The average electrical power demand at Fort Greely was approximately 1.8 MW when all buildings were in use. However, peak demands of up to 3.3 MW sometimes occurred during the winter. When the demand at Fort Greely exceeded the capacity of the substation, the additional power requirements were met by the three on-post diesel-powered generators, which together can generate up to 0.95 MW.

The Jarvis Creek substation is approximately 9 kilometers (5.5 miles) north of where the new transmission line would terminate on Fort Greely. An existing 25-kV distribution line also originates at the Jarvis Creek substation and parallels the eastern side of the Richardson Highway, except where it crosses the highway near the western end of the East-West runway at Allen Army Airfield. The crossing was made to avoid height restrictions for aircraft. After passing south of the runway area, it re-crosses the Richardson Highway and continues south. This line services Fort Greely and other communities south of Jarvis Creek.

### **3.1.8 LAND USE**

Land use can be defined as the human use of land resources for various purposes including economic production, natural resources protection, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Potential issues typically stem from encroachment of one land use or activity on another, or an incompatibility between adjacent land uses that leads to encroachment.

#### **Region of Influence**

The ROI for land uses includes all lands on and adjacent to Fort Greely that could be potentially affected by the Proposed Action.

#### **Affected Environment**

The post is not located in a municipality or a borough and there are no local zoning or land use policies. There are also no state plans or guidelines for the area. Therefore, existing land uses do not conflict with any Federal, state, or local land use plans or policies. The land around Fort Greely is primarily agricultural, undeveloped open space, forests, tundra, or wetlands and is sparsely populated, with the closest inhabited structure being in Delta Junction. Most development occurs on the Richardson Highway north towards Fairbanks, and some small settlements are found along the highways at Big Delta, Richardson, Alrich, and Birch Lake. The Trans-Alaska Oil Pipeline bisects Fort Greely, with a pumping station located 4 kilometers (2.5 miles) southwest of the cantonment area.

The area to the south and east of the potential sites is known as the Fort Greely East Training Area. This area of Fort Greely consists of 20,943 hectares (51,750 acres). This land was withdrawn from the public domain by Public Law 99-606. This area is primarily used as a non-firing maneuver area. Other than the vehicle test loops used to test vehicles in extreme weather conditions and varying snow depths, there are very few man-made structures. When portions of the range are not in use for the testing of materials, infantry, artillery, and engineer units use the area for non-firing marches, troop maneuvers, artillery unit training, and small arms training (with blank ammunition).

The military and the public use Fort Greely for a wide range of recreation activities. Portions of the base may be closed at times for military missions, and impact areas are always closed for safety considerations. Otherwise, most of the remainder of the base can be used for recreation after obtaining permission from Fort Greely. The most common recreation activities on the base are hunting, fishing, and trapping. Other activities include off-road vehicle use, hiking, backpacking, camping, boating, bicycling, wildlife watching, and skiing. The use of Fort Greely for subsistence is minimal.

### 3.1.9 NOISE

Noise is usually described as unwanted sound. Characteristics of sound include amplitude, frequency, and duration. Sound can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for the measure of the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound pressure levels are easily measured, but the variability is subjective, and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness."

Sound also varies with frequency or pitch. When describing sound and its effect on a human population, A-weighted sound levels, measured in A-weighted decibels (dBA), are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The American National Standards Institute established this filtering network. The A-weighted noise level has been found to correlate well with people's judgments of noisiness of different sounds and has been used for many years as a measure of community noise.

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time; therefore, to compare levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of noise on humans and animals, including land-use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

The primary environmental noise descriptor used in environmental noise assessments is the A-weighted Day-Night Equivalent Sound Level (which is abbreviated DNL and symbolized as  $L_{dn}$ ). The DNL was developed to evaluate the total daily community noise environment. The DNL is the average A-weighted acoustical energy during a 24-hour period, with 10 dBA added to all signals recorded within the hours of 10:00 p.m. and 7:00 a.m. This 10 dBA is a penalty that accounts for the extra sensitivity people have to noise during typical sleeping hours.

Almost all Federal agencies having non-occupational noise regulations use DNL as their principal noise descriptor for community assessments.

#### Region of Influence

The ROI for noise includes those areas potentially affected by proposed activities that could experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways

potentially affected by proposed activities that might experience a Continuous Equivalent Sound Level ( $L_{eq}(1 \text{ hour})$ ) greater than or equal to 67 dBA.

### **Affected Environment**

The area surrounding Fort Greely is sparsely populated, and thus, would be expected to have a background noise level of DNL less than or equal to 55 dBA. However, under certain conditions, a low-level droning noise from a nearby Alaska pipeline pumping station can be heard. This noise comes from the pumping stations' jet turbine engines and was estimated to be approximately 55 dBA.

The principal sources of noise at Fort Greely are vehicular traffic and military activities, including aircraft overflight and firing of large and small caliber weapons. Frequency and duration of noise from military activities varies as a factor of the irregular training schedules.

Noise from military activity at Fort Greely, while intermittent, can be fairly loud. Some representative examples include weapons testing, helicopters, and maintenance equipment. Noise from weapons testing typically ranges from 112 to 190 dBA. The noise levels on the ground from a helicopter at 460 meters (1,500 feet) and 76 meters (250 feet) of altitude are 79 dBA and 95 dBA, respectively. Maintenance equipment, such as the tracked vehicles used for trail maintenance, can generate noise levels up to 105 dBA.

The main highways in the vicinity of Fort Greely are the Richardson Highway and the Alaska Highway. No noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of Fort Greely.

### **3.1.10 SOCIOECONOMICS**

Socioeconomics describes a community by examining its social and economic characteristics. Several demographic variables are analyzed in order to characterize the community, including population size, the means and amount of employment, and income creation. In addition, socioeconomics analyzes the fiscal condition of local government and the allocation of the assets of the community, such as its schools, housing, public services, and healthcare facilities.

#### **Region of Influence**

The ROI is assumed to include Fort Greely, Delta Junction, and Big Delta.

### **Affected Environment**

Fort Greely is in Interior Alaska, on the Richardson Highway. The nearest city to Fort Greely is Delta Junction, about 16 kilometers (10 miles) north of the base. The area is sparsely populated with an economy dependent on Fort Greely, state employment, some agriculture and Alyeska Pipeline Service Company. Fort Greely started arctic training towards the end of the decade and in so doing became a major contributor to the local

economy. In July 1995, the Base Realignment and Closure Commission recommended realignment of Fort Greely, which was completed in July 2001.

### *Population*

The ROI is part of a wider region known as the Southeast Fairbanks Census Area. In 1997, it was estimated that the Census Area had a population of 5,563. The population of the ROI at that time was 2,059, or 37 percent of the Census Area.

Population growth in the Census Area was affected by the reduction in personnel at Fort Greely so that, unlike most of the rest of the state, its population fell to pre-1980 levels between 1990 and 1997. The impact of the downsizing of Fort Greely on the region's population is further emphasized as Fort Greely's share of the Census Area population clearly falls between 1990 and 1997.

The Alaska Native population of the ROI in 1990 was relatively small, with Fort Greely having the lowest density of the three communities at 1 percent. Delta Junction and Big Delta had Alaska Native populations of 4.4 percent and 4 percent respectively.

### *Employment*

Fort Greely prior to realignment accounted for approximately 50 percent of all the employment in its surrounding communities, emphasizing the lack of diversity in the economy of the ROI. The School District is the second largest government employer in the area, along with state and Federal highway maintenance services. The highway also provides some tourism-related employment during the summer months.

Unemployment in 1990 varied significantly among the three ROI communities. In the case of Big Delta, its extremely low unemployment rate was paralleled by its comparatively high percentage of economically inactive residents; 54 percent of its 1990 population was characterized as such.

### *Retail Sales*

Retailing within the ROI is limited to small convenience stores, usually combined with a gas station, and tourism-related retailing, including bars and restaurants. The nearest variety retailing center to the ROI is Fairbanks.

### *Income*

Big Delta had the highest median income among the three communities that are closest to Fort Greely. It also had the highest proportion of residents living below the poverty level.

### *Housing, Education, and Health*

There were 956 homes in the three communities surrounding Fort Greely in 1990. A little over 25 percent were vacant. This aggregate figure, however, masks a significant variation in housing stock and vacancy rates among the three communities.

There are four schools in Delta Junction, with a student roll of 491. The school at Fort Greely is not currently used due to base realignment. Delta Junction has a family medical center, and Fort Greely has a clinic. The nearest hospital is 153 kilometers (95 miles) away at Fairbanks.

#### *Fiscal Condition*

Delta Junction raised \$150,000 of revenue in 1997 from local service charges and external, state sources. It spent almost \$184,000 in the same year, the majority on public safety, roads, parks, and recreation. Delta Junction does not levy a bed tax on temporary accommodation.

### **3.1.11 WATER RESOURCES**

This section describes the existing water resource conditions at each of the proposed sites. Water resources include surface water, groundwater, water quality, and flood hazard areas.

Storm water management activities within the State of Alaska are governed by Title 18 Environmental Conservation, Chapter 60, Article 2 of the Alaska Administrative Code (AAC) in accordance with 40 CFR 122.26. Other applicable codes include Title 18 Environmental Conservation, Chapter 70 Water Quality Standards; Title 11 Natural Resources, Part 6 Lands, Chapter 93 Water Management; and Title 46 Water, Air, Energy, and Environmental Conservation. For construction projects, a copy of the Notice of Intent and SWPPP prepared for the EPA must be provided to the ADEC.

#### **Region of Influence**

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations. This includes the cantonment area and an adjacent area several miles south from the cantonment boundary.

#### **Affected Environment**

##### *Surface Water*

Fort Greely is in the Delta River watershed. The Delta River to the west and Jarvis Creek immediately east are the two primary drainages for the Fort Greely ROI. Both are glacier-fed and silt-laden. The peak flow in these water systems is reached in late summer, when snow and ice melt is augmented by rainfall. Minimum flow occurs in winter when precipitation occurs as snow. Other surface water bodies within the ROI are intermittent, unnamed creeks, and lakes. Jarvis Creek and Delta River are generally frozen solid during the winter.

Although floodplain boundaries have not been developed for the ROI, there is a low probability of flooding. High flows in the Delta River overflow to the west rather than toward the ROI. Jarvis Creek overflowed into an old channel during a 1967 flood. Since a barrier was placed at the overflow location, flooding along the old channel has not occurred.

Due to the relatively flat terrain and permeable soils within the ROI, much of the storm water runoff infiltrates before it reaches a water body. Fort Greely operates under an National Pollutant Discharge Elimination System (NPDES) Multi-Sector Industrial Storm Water Permit and SWPPP. The SWPPP identifies two outfalls from the main cantonment area. One discharges into Jarvis Creek, and the other discharges within 183 to 213 meters (600 to 700 feet) of Jarvis Creek.

#### *Groundwater*

One unnamed water-bearing unit has been described in the ROI. This unit consists of a lower stratified gravel layer. The top of the water-bearing unit is encountered at about 52 meters (170 feet) below ground surface. One boring completed at Fort Greely penetrated the alluvium to depths of 122 meters (400 feet) below ground surface. It has been reported that the lower stratified gravel aquifer is at least partially confined by low-permeability lenses and seams that may result in the formation of perched water zones.

Groundwater flows northeasterly at a regional gradient ranging from approximately 1.5 to 6 meters (5 to 21 feet) per mile. Groundwater in the area is recharged continuously by the Delta River and by infiltration of meltwater from the Alaska Range in the late spring and early summer. The depth to groundwater ranges from 53 meters (175 feet) to at least 91 meters (300 feet) below ground surface, and fluctuates in response to seasonal recharge. As of 1983, there were five usable wells on Fort Greely, located near the north end of the existing post, yielding an estimated combined capacity in excess of 15 million liters (4 million gallons) per day. Two new 1,893-liter- (500-gallon-) per-minute wells were developed during initial site preparation activities.

#### *Water Quality*

Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water. Secondary drinking water standards are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (skin or tooth discoloration) or aesthetic effects (taste, odor, or color) in drinking water. Surface water quality samples meet the primary drinking water standards; however, the concentrations of aluminum, iron, and manganese were higher than the secondary standards. Measurements of pH on Fort Greely were within the state standards.

Groundwater quality in the vicinity of Fort Greely meets the state drinking water standards.

### **3.1.12 ENVIRONMENTAL JUSTICE**

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued 11 February 1994. Objectives of the Executive Order include development of Federal agency implementation strategies, identification of minority and low-income populations where proposed Federal actions have disproportionately high and adverse human health and environmental effects, and participation of minority and low-income populations. Although an environmental justice

analysis is not mandated by NEPA, DoD has directed that NEPA will be used as the primary approach to implement the provision of the Executive Order.

The 1990 Census of Population and Housing reports numbers including both minority and poverty residents. Minority populations included in the census are identified as Black; American Indian, Eskimo or Aleut; Asian or Pacific Islander; Hispanic; or other. Poverty status (used to define low-income status) is reported as the number of families with income below poverty level (\$12,764 for a family of four in 1989, as reported in the 1990 Census of Population and Housing).

### **Region of Influence**

The ROI for environmental justice includes the Census Designated Places (CDP) (Big Delta and Fort Greely) and the closest city, Delta Junction that are in the Southeast Fairbanks Census Area.

### **Affected Environment**

Based upon the 1990 Census of Population and Housing, the Southeast Fairbanks Census Area has a population of 5,913. Of that total, 839 persons, or 14.19 percent, were low income, and 1,305 persons, or 22.07 percent were minority.

## **3.2 EARECKSON AS, ALASKA**

Eareckson AS is on Shemya Island about 2,414 kilometers (1,500 miles) from Anchorage, Alaska, and is part of the Near Islands group at the tip of the Aleutian Island chain. Shemya Island occupies approximately 1,425 hectares (3,520 acres) and is part of the Alaska Maritime National Wildlife Refuge administered by the U.S. Fish and Wildlife Service (USFWS) and is operated by the U.S. Air Force. The island has been developed by the military and continues to operate as an Intelligence Radar site whose principal purpose involves monitoring space and missile activities. The base is under control of the Eareckson AS Program Management Office, part of the 611<sup>th</sup> Air Support Group at Elmendorf AFB.

Eareckson AS is an isolated self-contained military installation. It has no surrounding communities. There is, therefore, no socioeconomic environment at Eareckson AS to be affected by this action.

### **3.2.1 AIR QUALITY**

Shemya Island has a maritime climate, characterized by long, moderately cold winters and short, cool summers. Shemya Island receives some form of precipitation nearly every day of the year and averages approximately 76 centimeters (30 inches) annually. A general description of air quality is provided in the beginning of section 3.1.1.

## **Region of Influence**

The ROI is generally limited to an area extending no more than a few tens of miles downwind from the source and includes the geographic airshed in which the emissions would occur, in this case, Shemya Island.

## **Affected Environment**

### *Regional Air Quality*

The only significant source of emissions in the vicinity of Shemya Island is Eareckson AS, which operates within the restrictions of its Title V Air Permit. As such, the area is in attainment for the NAAQS and state standards. The EPA has classified Shemya Island (and the vicinity of Eareckson AS) as Class II for Prevention of Significant Deterioration (PSD) review purposes. Class II areas can allow for moderate, well-controlled industrial growth.

### *Existing Emissions Sources*

Eareckson AS is classified as a major emissions source with emissions from boilers, generators, furnaces, fuel storage, and miscellaneous sources and maintains a Title V Air Permit issued by the ADEC. Annual emissions (1993/1994) included the following: carbon monoxide—91 metric tons (100 tons); oxides of nitrogen—349 metric tons (385 tons); oxides of sulfur—28 metric tons (31 tons); PM-10—9 metric tons (10 tons); and volatile organic compounds—15 metric tons (16 tons). Eareckson AS also emitted 0.57 metric tons (0.63 tons) of hazardous air pollutants. As such, Eareckson AS is not a major source of hazardous air pollutants.

## **3.2.2 AIRSPACE**

Airspace, or that space which lies above a nation and comes under its jurisdiction, is generally viewed as being unlimited. However, it is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. The scheduling, or time dimension, is a very important factor in airspace management and air traffic control.

Under Public Law 85-725, the Federal Aviation Administration (FAA) is charged with the safe and efficient use of the nation's airspace and has established certain criteria and limits to its use. The method used to provide this service is the National Airspace System. This system is "...a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information and manpower and material" (Aeronautical Information Manual, 1998—FAR/AIM 98). Figure 3-3 depicts the various classes of controlled airspace.



## **Region of Influence**

The ROI is defined as that airspace within approximately 185 kilometers (100 nautical miles) of the existing COBRA DANE phased array radar, and the proposed IDT and DSCS on Shemya Island. The potentially affected airspace is described below in terms of its principal attributes, namely: controlled and uncontrolled airspace; en route airways and jet routes, airports and airfields, air navigation and communication facilities, and air traffic control.

## **Affected Environment**

### *Controlled and Uncontrolled Airspace*

The ROI is composed of Class A airspace from 5,486 meters (18,000 feet) mean sea level up to and including flight level 600 (18,288 meters or 60,000 feet). Below 5,486 meters (18,000 feet), the ROI is composed largely of Class G (uncontrolled) airspace, except for the area around Eareckson AS, which is Class E airspace. The Class E airspace extends upward from 213 meters (700 feet) above the surface within a 13-kilometer (6.9-nautical-mile) radius of Eareckson AS, and includes that airspace extending upward from 366 meters (1,200 feet) above the surface within a 48.5-kilometer (26.2-nautical-mile) radius of Eareckson AS, excluding that airspace more than 22 kilometers (12 nautical miles) from the shoreline (see figure 3-4). There is no Class B, Class C or Class D airspace in the ROI. (National Ocean Service, 2000)

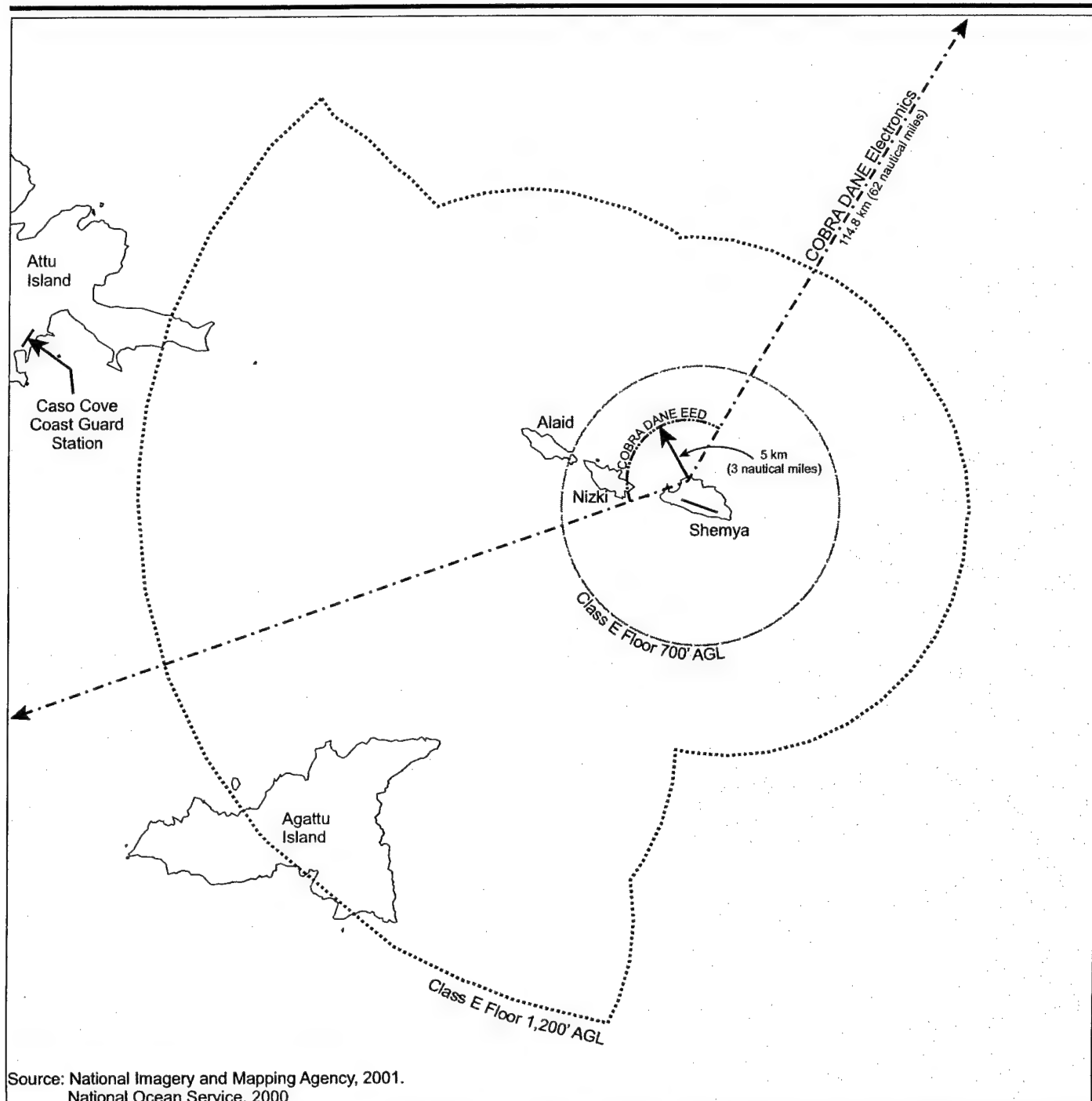
Eareckson AS is currently the site of the COBRA DANE (AN/FPS-108) phased array radar. Formerly used as a strategic warning radar, it is now used primarily for tracking objects in space. It operates in the 1,175 to 1,375 MHz frequency band. The Western Aleutian Islands Sectional Aeronautical Chart includes a radiation hazard notice for Shemya Island. The DoD Flight Information Publication, Area Planning, North and South America, states there is a radiation hazard area from surface to 4,877 meters (16,000 feet) mean sea level for aircraft equipped with externally mounted electroexplosive devices.

### *Military Training Routes*

Although there are no Military Training Routes in the ROI, there is a Military Instrument Flight Rules route (route 604) from St. Paul Island to Eareckson AS. Military Instrument Flight Rules routes are a military backup to the civilian (FAA) system and are used by military aircraft.

## **Airports/Airfields**

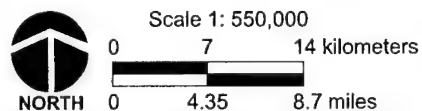
There are two military airports/airfields in the airspace ROI: Eareckson AS on Shemya Island, and Casco Cove Coast Guard Station on Attu Island approximately 61 kilometers (33 nautical miles) west of Eareckson AS (figure 3-4). The instrument approach and standard instrument departure tracks into and out of Eareckson AS are to the east, southeast, west, and southwest (National Ocean Service, 2001—U.S. Terminal Procedures, Alaska). There are no public airports or private airfields/airstrips in the ROI. However, two C-130 cargo flights originating out of Elmendorf AFB travel to Eareckson AS on a weekly basis to resupply the AS with necessary commodities (Copeland, 2001).



## EXPLANATION

AGL = Above Ground Level

- COBRA DANE Aircraft Electro-Explosive Device (EED),  
Military Aircraft Electric Interference (surface to 16,000 feet)
- . - . - COBRA DANE Civilian Aircraft Electronic Interference (surface to 16,000 feet)
- Class E Airspace - Floor 700 feet AGL
- Class E Airspace - Floor 1,200 feet AGL



02-09-02 XBR Class E Airspace 3-4

## Controlled Airspace

Shemya Island Vicinity

Figure 3-4

### *Air Navigation and Communications Facilities*

Both Eareckson AS and Casco Cove Coast Guard Station on Attu Island are the sites of non-directional radiobeacons. However, Eareckson AS's non-directional radiobeacon is currently non-operational and is due to be replaced (Copeland, 2001). In addition, Eareckson AS is the site of a very high frequency (VHF) Omni-Directional Range/Tactical Air Navigation facility, an airport surveillance radar (AN/GPN-20), and an instrument landing system.

The instrument landing system is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The ground equipment consists of two highly directional transmitting systems known as the localizer and the glideslope.

One of the four FAA Long Range Navigation radio transmitters in the North Pacific Chain, which operate at the 100 kilohertz frequency, is located on Attu Island. The other three transmitters are well outside the ROI in Saint Paul, Kodiak, and Port Clarence, Alaska (Aeronautical Information Manual, 2001—FAR/AIM 01). There are no other air navigation or communications facilities, including air route surveillance radars, which track aircraft en route and operate in the L-Band (1 to 2 gigahertz) in the airspace ROI.

### *Air Traffic Control*

The airspace ROI lies within the Anchorage Oceanic Control Area/Flight Information Region and within the U.S. Alaskan Air Defense Identification Zone. In the Class A (positive control areas) airspace all operations are conducted under instrument flight rules procedures and are subject to air traffic control clearances and instructions. Aircraft separation and safety advisories are provided by air traffic control, the Anchorage Air Route Traffic Control Center. In Class E airspace (general controlled airspace) operations may be either under instrument flight rules or visual flight rules: separation service is provided to aircraft operating under instrument flight rules only, and to the extent practicable, traffic advisories to aircraft operating under visual flight rules, by the Anchorage Air Route Traffic Control Centers. For Class G airspace (uncontrolled airspace), operations may be either under instrument or visual flight rules, but no air traffic control service is available.

The airspace beyond the 22-kilometer (12-nautical-mile) limit is in international airspace. In this airspace outside U.S. territory, FAA air traffic service is provided in accordance with Article 12 and Annex 11 of the International Civil Aviation Organization (ICAO) Convention. Because it is in international airspace, the procedures of the ICAO, outlined in ICAO Document 444, Rules of the Air and Air Traffic Services, are followed. ICAO Document 444 is the equivalent air traffic control manual to FAA Handbook 7110.65, Air Traffic Control. The FAA acts as the United States agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Anchorage Air Route Traffic Control Centers.

### 3.2.3 BIOLOGICAL RESOURCES

A general description of biological resources is provided in the first paragraph of section 3.1.2.

#### **Region of Influence**

The ROI for biological resources includes the area within and adjacent to the Proposed Action sites on Eareckson AS and other important wildlife areas of the surrounding Alaska Maritime National Wildlife Refuge that could potentially be affected by the proposed activities.

#### **Affected Environment**

##### *Vegetation*

The predominant vegetative associations on Shemya Island consist of beach grass that tends to colonize disturbed areas, and remnants of crowberry tundra (see figure 3-5). Beach grass dominates the shorelines within bays, inlets, and coves of the island. Other plants inhabiting this area are beach pea, seabeach sandwort, cow parsnip, cinquefoil, and species of sedge. The tundra is composed mainly of grasses, sedges, heath, and composite families with an almost continuous mat of mosses and lichens.

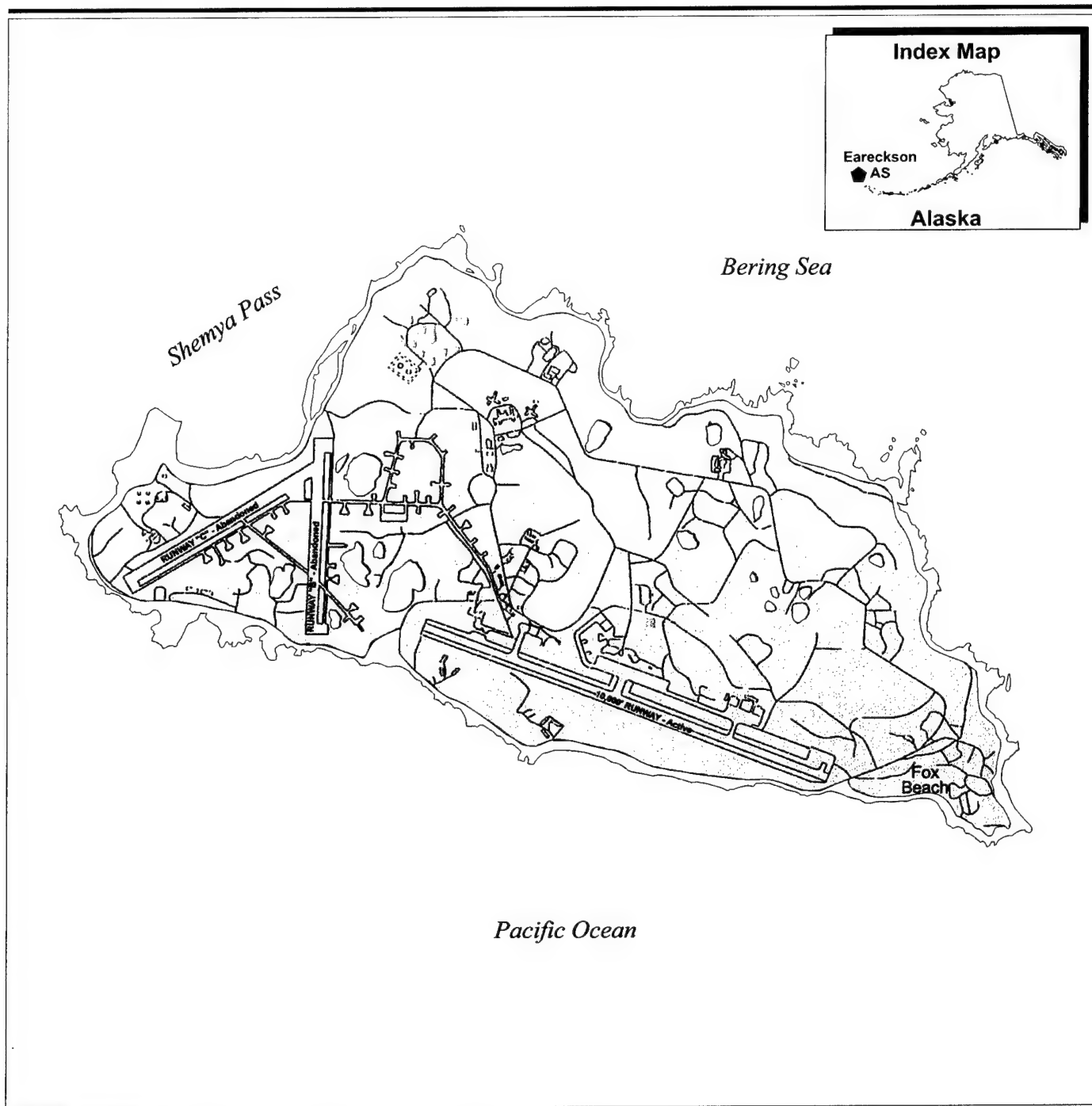
Dwarf shrubs such as crowberry, cloudberry, lapland cornel, and blueberry are located at higher elevations with better drainage. Forbs such as bistort, buttercup, lousewort, monkshood, and violet are scattered throughout the area. There are no large native trees. Only a few Sitka spruce, introduced by the Russians in 1805, and small groves of other trees introduced by Americans during World War II exist on the island today.

Eelgrass beds are confined to lagoons and estuaries and are an important food source for waterfowl and invertebrates and provide food and rearing habitat for juvenile groundfish and salmon. Pondweed, water milfoil, and mare's tail are the primary freshwater vegetation. Large mosses and leafy liverworts are located in freshwater streams.





##### *Wildlife*

Marine, freshwater, and potentially anadromous fish occur on and in the area surrounding Shemya Island. However, freshwater fish are not considered a significant resource, and commercial fishing in the local marine area is considered minor (U.S. Air Force, 1998). Anadromous fish of the Near Islands include pink, chum, sockeye, and coho salmon. Shemya Island, however, has no salmon runs.

There are no indigenous terrestrial mammals on Shemya Island. The blue phase arctic fox introduced in 1911 is the largest mammal on the island. The other terrestrial mammals are introduced rodents, deer mice and rats.



#### EXPLANATION

-  Roads
-  Water Area
-  Beach Grass
-  Grasses, Sedges, Heath, and Dwarf Shrubs

#### Vegetation

Eareckson Air Station,  
Shemya Island, Alaska

**Figure 3-5**



Shemya Island is along the migratory route of and visited by a high diversity of North American and Asian shorebirds and waterfowl. Its rocky cliffs provide ideal habitat for seabird colonies and roosting sites for the Peale's peregrine falcon. Pelagic and red-faced cormorants and tufted puffins nest offshore on islets located on the north side of Shemya Island, but seabirds have been mainly extirpated from the main island by introduced foxes and rats.

Waterfowl use the lakes of Shemya Island as feeding and resting places during migration. Glaucous-winged gulls are found at Shemya year-round. A few nest on offshore islets, but hundreds feed in the intertidal zone. The emperor goose, a species on the decline, primarily uses the northern shore intertidal areas, but can be found around the entire perimeter of the island. Emperor geese, harlequin ducks and common eiders are among the species of marine birds that use the intertidal and shallow subtidal zones around most of the island. Asiatic waterfowl, shorebirds, raptors, and songbirds use much of the island including the north shore bluffs, which provide important resting habitat during migration. (Siekaniec, 2002).

Harbor seals have been observed along the northwest coastline of Shemya Island.

#### *Threatened and Endangered Species*

Species with Federal or state status that potentially occur in the area of Eareckson AS are listed in table 3-1. The Steller sea lion (*Eumetopias jubatus*) is the most abundant marine mammal species found in the area. Haul out occurs on offshore islands northeast of Shemya Island. Two haulout grounds have been located on the north and northwest ends of the island. The northern sea otter (*Enhydra lutris kenyoni*) uses the southwest coastal kelp beds of Shemya Island for feeding, pupping (March through May), and as haulout grounds. Although populations began increasing when all sea otter hunting was prohibited after 1960, the sea otter population in the Aleutian Islands area has declined approximately 70 percent since the early 1990s. The cause of the decline is still a subject of controversy. The Aleutian Islands population of the northern sea otter was recently added to the candidate species list and may be proposed for listing under the Endangered Species Act in the near future.

The blue whale (*Balaena musculus*), bowhead whale (*Balaena mysticetus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), northern right whale (*Eubalaena glacialis*), and sperm whale (*Physeter macrocephalus*) are seasonal visitors to the waters surrounding Shemya Island. Bowhead and humpback whales may be observed passing by the shore during migration in May and October. Northern right and sperm whales can be observed in the area from April to September. The blue and fin whales may be observed feeding in the area during the summer.

The Aleutian Canada goose (*Branta canadensis leucopareia*) was recently delisted from a threatened species to a recovered one that requires monitoring for the next 5 years. The goose is found on the island from mid April through mid June and mid August through mid

**Table 3-1: Sensitive Species with Federal or State Status Under the Endangered Species Act Potentially Occurring in Project Areas**

Scientific Name	Common Name	Status		Habitat and Distribution
		State	Federal	
Birds				
<i>Branta canadensis leucopareia</i>	Aleutian Canada goose <sup>(1)</sup>	--	--	Visitor to Shemya Island from April–June and August–October to feed and for other non-breeding activities
<i>Diomedea albatrus</i>	Short-tailed albatross	E	E	Unlikely visitor to Shemya Island; observed during the summer months in the Aleutian Islands, Bering Sea, and Gulf of Alaska
<i>Somateria fischeri</i>	Spectacled eider	--	T	Unlikely to be observed off the shore of Shemya Island, located in northern Bering Sea in winter
<i>Polysticta stelleri</i>	Steller's eider	--	T <sup>(2)</sup>	Occasional visitor to intertidal waters of Shemya Island during the winter months
Mammals				
<i>Balaena mysticetus</i>	Bowhead whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed during migration in May and October
<i>Balaenoptera musculus</i>	Blue whale	--	E	Seasonal visitor to the waters surrounding Shemya Island during the summer months
<i>Balaenoptera physalus</i>	Fin whale	E	E	Seasonal visitor to the waters surrounding Shemya Island during the summer months
<i>Megaptera novaeangliae</i>	Humpback whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed during migration in May and October
<i>Eubalaena glacialis</i>	Northern right whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed from April to September
<i>Physeter macrocephalus</i>	Sperm whale	E	E	Seasonal visitor to the waters surrounding Shemya Island, usually observed from April to September
<i>Eumetopias jubatus</i>	Steller sea lion	E	T	Haul out grounds on offshore islands northeast of Shemya Island and on the north and northwest ends of the island
<i>Enhydra lutris kenyoni</i>	Northern sea otter	--	C	Uses the southwest coastal kelp beds of Shemya for feeding, pupping (March through May), and as haulout grounds

Source: U.S. Fish and Wildlife Service, 1996, 2002; Alaska Department of Fish and Game, 1997.

<sup>(1)</sup> Recently delisted

<sup>(2)</sup> Only the North American breeding population is considered threatened.

-- = Not listed  
E = Endangered  
T = Threatened  
C = Candidate

October for non-breeding activities, such as staging, resting, and feeding (crowberry shrubs) during migration. Feeding occurs over the entire island primarily during daylight hours as most of the geese return to neighboring predator-free islands for the night. The geese do not nest on Shemya Island, and the island is not suitable for nesting recovery efforts due to the presence of humans, rodents, and blue phase arctic fox. Removal of foxes would increase goose population and therefore increase the potential for bird strikes and hazard to aircraft (Siekaniec, 2002). (U.S. Fish and Wildlife Service, 2001)

The short-tailed albatross (*Diomedea albatrus*) is officially listed as an endangered species in U.S. territorial waters (Gulf of Alaska, Aleutian Islands, Bering Sea Coast) as well as Japan, Russia, and the high seas (U.S. Fish and Wildlife Service, 2002). Most summer sightings of this albatross are in the Aleutian Islands, Bering Sea, and Gulf of Alaska. Short-tailed albatross probably occur in low numbers near Shemya Island (Siekaniec, 2002). Its presence on Shemya Island is considered unlikely. This species has been proposed for listing for the near-shore areas, 5 kilometers (3 miles) out from U.S. shores, to correct an administrative oversight.

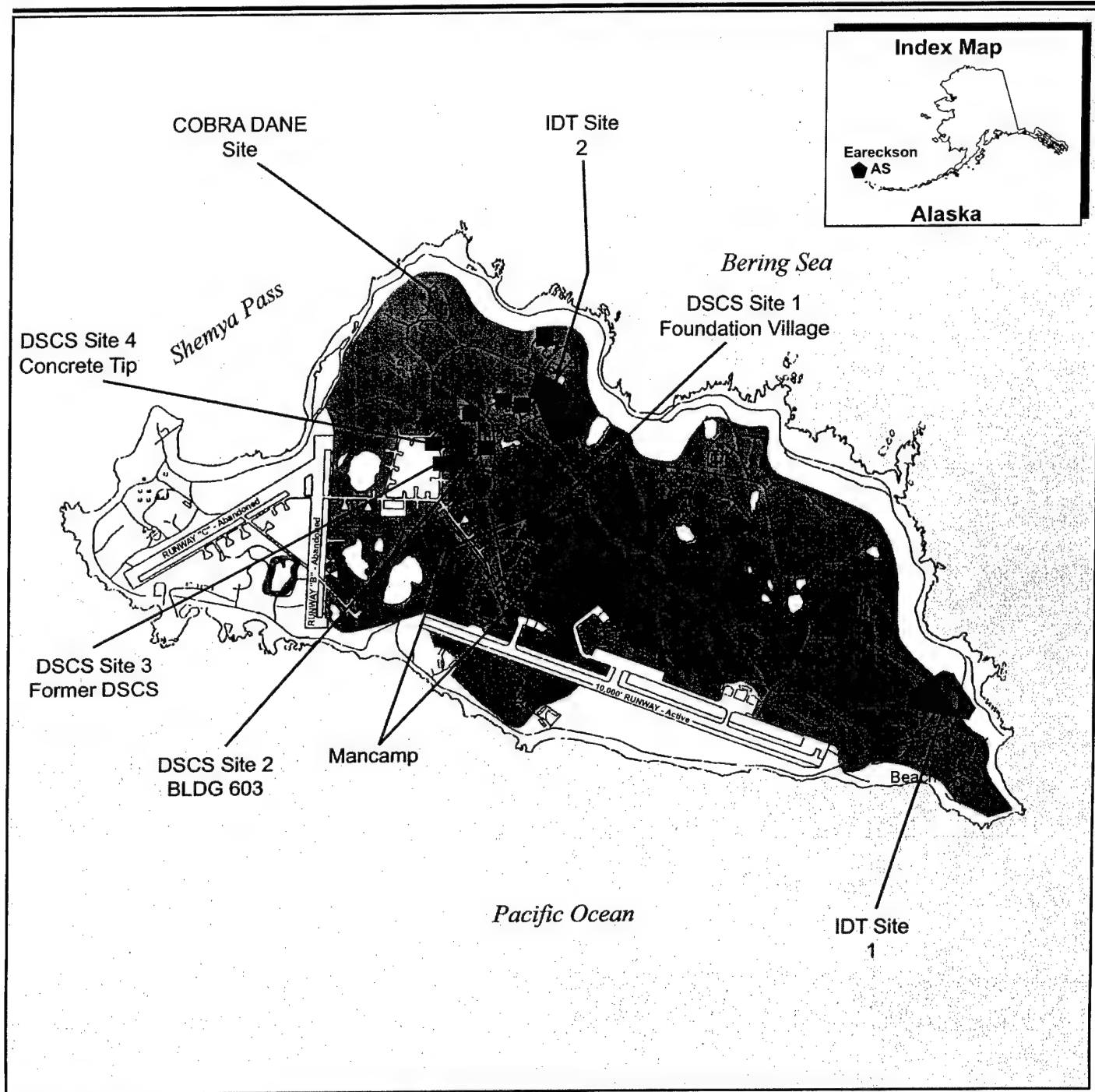
It is highly unlikely that the threatened spectacled eider (*Somateria fischeri*) would be observed offshore of Shemya Island (U.S. Fish and Wildlife Service, 2002). The Steller's eider (*Polysticta stelleri*) may winter annually in low numbers in nearshore marine waters in the western Aleutians and are seen at Shemya Island occasionally (Siekaniec, 2002).

#### *Environmentally Sensitive Habitat*

The Department of the Air Force has primary jurisdiction, custody, and control over Shemya Island and its waters (including submerged lands). Shemya Island and its waters (including submerged lands) are part of the Alaska Maritime National Wildlife Refuge and the National Wildlife Refuge System, and the Secretary of the Interior has jurisdiction secondary to that of the Department of the Air Force. No federally designated critical habitat has been identified on Eareckson AS.

A substantial portion of Eareckson AS (80 percent, or approximately 1,140 hectares [2,816 acres]) falls within a wetlands classification under criteria applied by the U.S. Army Corps of Engineers (see figure 3-6). Beaches, cliffs, lakes, disturbed areas west of the abandoned Runway B, areas around Runway 10-28 and slopes south of this runway, and other areas altered by construction of roads, building pads, and structures are the only areas excluded from wetlands classification.

The USFWS has indicated the Upper, Middle, and Lower Lake system is of interest for its ability to support migratory birds and provide a resting place. Asian birds, not seen elsewhere in the United States, are often blown off course during migration by storms and appear to be attracted by the airfield lights located in the vicinity of the lakes at Eareckson AS.



#### EXPLANATION

- Roads
- Land Area
- Water Area
- Wetlands



Scale  
0 1,738 3,475 feet  
0 530 1,059 meters

#### Wetlands

Eareckson Air Station,  
Shemya Island, Alaska

**Figure 3-6**

### 3.2.4 CULTURAL RESOURCES

A general description of cultural resources is located in the beginning of section 3.1.3.

#### **Region of Influence**

The ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment.

#### **Affected Environment**

##### *Prehistoric and Historic Archaeological Resources*

It is assumed that the Aleutian Islands were first settled in the Umnak Island area and that inhabitants then spread east and west until the entire chain became occupied. Near Islands assemblages appear distinctive from 2,600 years ago until about 400 years ago, when similarities to other assemblages farther east became more apparent.

It is uncertain whether Shemya Island was inhabited when first sighted by the Russians in 1741. However, Russian records reveal that, when they arrived, practically every island was inhabited. The first recorded contact between Europeans and the native people of the Near Islands was in 1745, when Russian hunters landed on Agattu and Attu in search of sea otters. It has been estimated that at that time the Near Islands had a population of approximately 1,000 Aleuts. Approximately 100 people apparently occupied Shemya Island.

By the end of the 1760s, the Aleut population of the Near Islands had declined and Shemya Island was abandoned as a permanent settlement. It remained essentially unpopulated until around 1922, when introduced arctic fox trapper's cabins were built. In 1940, approximately 40 inhabitants of Attu used the cabins on Shemya for trapping. There were no permanent inhabitants of Shemya Island at that time.

A total of nine prehistoric archaeological sites have been recorded on Shemya Island. Three of the sites were destroyed by previous construction, and the remaining six have been disturbed by construction and/or vandalism. All of the prehistoric sites recorded on Shemya Island are located along the shoreline and represent middens occupied by prehistoric Aleuts. Traces of semi-subterranean houses appear to be present at some sites, and at least one burial has been reported. There have been no reported sites from the higher elevations of the island.

##### *Historic Buildings and Structures*

The western Aleutians possessed strategic military importance to the United States during World War II because of their relative proximity to northern Japan, and Shemya Island was especially suitable for long runways and the operation of large bombers.

In June 1942, Japanese carrier-based planes attacked U.S. Army and Navy forces at Dutch Harbor and Japanese troops landed on Attu and Kiska, but Shemya remained unoccupied. The United States began air attacks of Kiska and Attu in May 1943. Towards the last days of this battle U.S. Army units landed on Shemya Island to begin construction of an airfield and, by the end of 1943, the United States had established bases on both Attu and Shemya.

Between 1943 and 1944 the U.S. Army erected Quonset huts, numerous permanent buildings, four massive birchwood hangars, and defensive fortification, such as concrete bunkers and gun emplacements. At the end of 1943, the Aleutians ceased to be a combat theater and the Japanese made no further attempt to contest U.S. control of the island chain; the final American bombing raid from the Aleutians was launched from Shemya in August 1945.

Between 1945 and the early 1950s, Shemya Island had only limited military importance, and activities and personnel at the base were reduced. Its mission was primarily as a refueling stop for support and supply aircraft. In 1954, following the Korean Armistice, the base at Shemya was deactivated and its facilities turned over to the Civil Aeronautics Authority. Subsequently, the facilities were leased to Northwest Orient Airlines, which used them for refueling commercial aircraft until 1961.

In 1958, Shemya Island was reactivated as a U.S. Air Force installation, assigned to the 5040<sup>th</sup> Air Base Squadron, and many Cold War military facilities were constructed, including a radar facility and three antennas. This radar facility was demolished in the late 1970s and replaced by a phased array radar designated COBRA DANE, which became operational in 1977. In 1993, Shemya AFB was redesignated Eareckson Air Force Station. In 1994, as a result of downsizing, the Air Force Station was further redesignated an Air Station.

Argonne National Laboratory conducted an inventory of historic buildings and structures in 1996. The only facility from the World War II and Cold War periods at Eareckson AS determined to be a historically significant Cold War era property and eligible for listing on the National Register is the COBRA DANE radar.

#### *Native Populations/Traditional Resources*

Eareckson AS is located within the traditional territory of the Aleut. The Bureau of Indian Affairs has determined that three of the prehistoric archaeological sites are eligible for conveyance to the Aleut Corporation under section 14(h) (1) of the Alaska Native Claims Settlement Act.

#### *Paleontological Resources*

There have been no paleontological sites reported on Shemya Island; however, given the physiographic setting, fossils are possible.

### 3.2.5 GEOLOGY AND SOILS

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

#### **Region of Influence**

The ROI for geology and soils includes that area of Eareckson AS that could potentially be disturbed by construction and operation activities associated with the DSCS, IDT, connecting roads, and infrastructure.

#### *Physiography*

Shemya Island is near the western end of the Aleutian archipelago (arc or chain), that forms a bow-shaped string of islands that stretches from the southwest corner of mainland Alaska to within 161 kilometers (100 miles) of the Kamchatka Peninsula of Russia, a distance of over 2,414 kilometers (1,500 miles). Shemya is part of the Near Islands group, the westernmost group of islands in the Aleutian Chain.

Shemya Island is a flat-topped seamount approximately 2.4 kilometers (1.5 miles) wide and 5.7 kilometers (3.5 miles) long on a west-east axis. Typical surface elevations range from 6 to 8 meters (20 to 25 feet) above sea level on the Pacific side to a maximum height of 73 meters (240 feet) on the northern Bering Sea side. The island is rimmed with small sandy/gravelly beaches and rugged bedrock crags. A small raised wave-cut platform nearly encircles Shemya Island and suggests previous ocean level changes. The surface is typical of hummocky glaciated terrain and tundra regions. Surface and subsurface drainage flows in a south-southwest direction. The construction of the existing 3,048-meter (10,000-foot) runway has greatly modified the natural surface drainage of the island.

#### *Geology*

Regionally, Shemya Island is part of the Aleutian volcanic arc of the North Pacific Ocean. The bedrock geology of the island consists of intrusive and extrusive igneous complexes; primarily Tertiary and Quaternary in age (30 million years to present). Bedrock on the western half of the island consists of a basement complex of fine-banded argillites, limey argillites, siltstone, graywackes, and conglomerates. On the north side of the island (Alcan Cove) silicified and pyritized lavas outcrop. Submarine pyroclasts and volcanic intrusives cover the eastern half of the island. These rocks overlie the sedimentary basement complex of the western half of the island. Intrusives composed of feldspar and hornblende porphyry outcrop along the northeast and southeast shores and locally inland.

Unconsolidated surface materials on Shemya Island are generally sand, gravel, and peat deposited by marine, alluvial, and eolian processes. A thin layer of remnant glacial outwash sand and ground moraine covers most of the island. Peat is the predominant surface material found over the east-northeast portion of the island. The western one-third of the island and part of the south side of the island are covered by active and stable sand dunes.

### *Soils*

A matted accumulation of tundra peat is the predominant surficial soil on the island. The highly saturated material is typical of tundra regions. This layer varies in thickness, but is usually 1 to 2 meters (2 to 5 feet) deep. Depth to bedrock varies from zero to over 8 meters (25 feet). Sand soils over bedrock tend to dominate the south shore beach areas. Most of the surficial materials on Shemya Island can retain and transmit water. Shemya Island has no permafrost.

### *Mineral Resources*

Known mineral resources on Shemya Island are restricted to sand and gravel for construction purposes. The U.S. Air Force has proposed to develop a borrow pit and quarry plan for controlled removal of available aggregate resources to support future construction and maintenance at Eareckson AS. Sand and gravel resource material on the island is limited.

### *Geologic Hazards*

The convergence of the Pacific and North American crustal plates creates one of the world's most active seismic zones. Over 100 earthquakes of magnitude 7 or larger have occurred along this boundary since the turn of the century. Shemya Island falls within seismic zone 4, which reflects the highest hazard potential for earthquakes and severe ground shaking.

Eareckson AS is susceptible to tsunamis (tidal waves) resulting from earthquake ground displacements and earthquake triggered submarine landslides. A tsunami line has been established at the 30-meter (100-foot) elevation contour for new construction.

## **3.2.6 HAZARDOUS MATERIALS AND WASTE**

A general description of hazardous materials and waste is provided in the beginning of section 3.1.5.

### **Region of Influence**

The ROI for hazardous materials and waste includes the Eareckson AS infrastructure and existing facilities within the main base cantonment. The Proposed Action may require the use of base infrastructure and existing facilities.

### **Affected Environment**

#### *Hazardous Materials Management*

Eareckson AS routinely receives and stores small quantities of hazardous materials, including a variety of flammable and combustible liquids such as aviation fuels. Additional hazardous materials utilized by the base include acids, corrosives, compressed gases, hydraulic fluids, solvents, paints, paint thinners, and lubricants. Supplies, including petroleum products, arrive either by barge during the summer months or by aircraft year round. JP-8 and gasoline arrive by barge and are stored in bulk storage tanks since they are

used in large quantities. Most other petroleum products and chemicals are used in much smaller quantities and typically arrive in 208-liter (55-gallon) drums or smaller containers. Hazardous materials are controlled and managed through a hazardous materials program.

Storage tanks and associated piping systems at Eareckson AS are used to store and distribute various petroleum products or wastes, and other miscellaneous products. An Environmental Baseline Survey for potential GMD facilities at Eareckson AS was completed in April 2001. Of the 22 former or current UST locations associated with the sites, 15 have been removed. Of the 14 former or current AST locations, only 5 were still in place (National Missile Defense Joint Program Office, 2001). All ASTs and USTs at Eareckson AS are currently being evaluated to determine whether they are needed to support operations under the existing Base Operation Support Contract. Unneeded tanks and their associated pipelines that are found to be in excess will be cleaned, closed, and removed. Chronic low-level oiling of Shemya beaches has been documented over the past decade. The source of the oil is unknown, but it appears to be crude or diesel. Emperor geese and glaucous-winged gulls have been observed with oiled feathers and other species may also be affected (Siekaniec, 2002).

Eareckson AS administers a SWPPP that includes site specific good housekeeping practices, facility surveys, satellite accumulation area inspections, vehicle inspections conducted daily by the operator, employee training, preventive maintenance, and spill prevention and response. Eareckson AS also maintains an Oil and Hazardous Substance Discharge Prevention and Contingency Plan that addresses spill prevention and preparedness. The base submits annual emergency response and extremely hazardous substances updates to the local emergency management officials.

#### *Hazardous Waste Management*

Eareckson AS has implemented a Hazardous Waste Management Plan that sets forth the policies and procedures to be followed when handling hazardous wastes. Hazardous wastes generated at Eareckson AS include solvents, petroleum, oil and lubricants, fuel wastes, batteries, asbestos, PCBs, and wastes generated from site remediation. Eareckson AS is defined as a small quantity generator by the EPA and generates less than 100 kilograms (220 pounds) of hazardous waste per month.

Hazardous wastes and waste petroleum products are accumulated at approximately 17 locations throughout the installation. Eareckson AS is not permitted to dispose of hazardous wastes. All hazardous wastes with no energy recovery potential are sent to the Defense Reutilization and Marketing Office at Elmendorf AFB.

#### *Pollution Prevention*

The majority of waste streams at Eareckson AS are recycled or utilized for energy recovery. Used fuel, oil, oil filters, absorbent pads, and other petroleum contaminated waste solids are burned for energy recovery. Antifreeze is collected and recycled for reuse on the facility. Batteries are maintained for recycling through the Defense Reutilization and

Marketing Office, and products such as transformer silicon oil are returned to the manufacturer for recycling.

#### *Installation Restoration Program*

The U.S. Air Force began the IRP process at Eareckson AS in 1984. Fifty IRP sites have been identified and major Preliminary Assessment activities have been conducted at the installation. Additional information was gathered from site inspections, remedial investigations, and feasibility studies conducted at the 50 sites. Restoration activities were conducted at many of the Eareckson AS sites prior to 1994.

#### *Asbestos*

A comprehensive asbestos survey for Eareckson AS was completed in 1992. Based on the results of the survey, asbestos-containing material is assumed or confirmed to be present in 48 facilities. In compliance with standard U.S. Air Force regulations, any friable asbestos-containing material must be removed if it is likely to release airborne fibers and cannot be reliably maintained, repaired, or isolated. The base asbestos manager is contacted at all times before any demolition or renovation occurs in order to take proper action and prevent material from becoming airborne. However, the condition of asbestos in several buildings is unknown and needs to be investigated further.

#### *Polychlorinated Biphenyls*

All electrical equipment containing PCBs at Eareckson AS has been replaced, and PCB-containing transformers have been fully cleansed of the PCB-containing fluids. Eareckson AS is considered PCB free.

#### *Lead-based Paint*

No facilities at Eareckson AS have been tested for lead-based paint. It should be assumed that most facilities constructed before the implementation of the DoD ban on the use of lead-based paint in 1978 are likely to contain one or more coats of such paint, and are a probable concern. Sixty-nine existing facilities at the site were constructed before 1978.

#### *Radon*

Radon testing was conducted at Eareckson AS in May 1988. Of the 12 samples taken, 10 were below the U.S. EPA guidelines of 4 picocuries per liter, and 2 were below detection levels. Hence, radon is not a concern at Eareckson AS.

#### *Pesticides*

The use of pesticides in and around Eareckson AS has not been limited to specific sites. The low levels of pesticides detected in sampling media throughout the installation are consistent with the controlled application of pesticide for insect control and does not present a threat to the human health or the environment.

### 3.2.7 HEALTH AND SAFETY

A general description of health and safety is provided in the beginning of section 3.1.6.

#### **Region of Influence**

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities.

#### **Affected Environment**

##### *On-base Safety*

The U.S. Air Force has developed standards that dictate the amount of fire equipment that must be present based on the types of aircraft and total square footage of base structures and housing. The Eareckson AS fire department meets these standards, maintaining four crash fire trucks, three structural pumpers, and one spill response truck. One centrally located facility houses the equipment. The positioning of this facility also meets the U.S. Air Force time and distance requirements for facility response.

Safety zones around the airfield have been established to address threats to human safety from aircraft accidents at Eareckson AS. In order to minimize the risk at each end of the runway, a Clear Zone and Approach Zones have been designated. These zones have been established to limit development around the airfield on the island.

Other base safety issues include ESQDs associated with aircraft loading and unloading areas, unexploded ordnance areas, World War II bunkers, and the weather. Although no ordnance is stored on the base, the U.S. Air Force still maintains ESQDs along the aircraft flight line for aircraft using the airfield. There are presently four designated areas on the island that have known unexploded ordnance. These areas are clearly marked and personnel are informed of these areas. Periods of hazardous weather conditions (usually high winds) occur at Eareckson AS, and individuals are warned to take precautions during these conditions. The base safety office may limit outside access during these conditions. The base contractor has a Health and Safety Plan, and there is a full-time emergency medical technician on the island.

The COBRA DANE EWR on Eareckson AS can adversely affect electro explosive devices aboard aircraft. A separation distance of 5 kilometers (3 miles) is recommended for electro explosive devices aboard aircraft, in the presence phase, and 1.20 kilometers (0.75 mile) for electro explosive devices on the ground, in the handling/loading phase.

**Radiation Hazards.** The RF hazard to flying aircraft with electro explosive devices aboard is out to 5 kilometers (3 miles) in the area in front of the COBRA DANE radar as shown in figure 3-4. The hazard for aircraft on the ground where electroexplosive devices are being handled is 1.2 kilometers (0.75 mile). The RF hazard to personnel that exists directly in front of the COBRA DANE is mitigated by fences that restrict access to the area in front of the radar and by warnings signs that inform personnel of the RF radiation hazard. No hazard to fuels is expected.

COBRA DANE presents the highest probability for radiation hazards. COBRA DANE is a phased-array radar that collects radar information on foreign sea-launched and intercontinental ballistic missiles for intelligence and treaty verification purposes.

COBRA DANE normally operates in the frequency range (1,215 to 1,250 MHz) and on infrequent occasions and for an interval of up to 15 minutes COBRA DANE sometimes operates in the frequency range (1,175 to 1,375 MHz). When the power density is calculated or measured over the 30-minute averaging time (required by the standard at these frequencies) the average power density for the 15-minute maximum duration, 1,175-1,375 MHz frequency range is reduced by half. Its beam is continually scanning, and therefore will interact with the surrounding environment. However, due to the location and orientation of the COBRA DANE antenna on top of a cliff facing the open ocean, the interaction with the environment is limited to sidelobe and backlobe interactions.

The personnel exposure limit standards for uncontrolled environments (locations where the general public has access) for frequencies between 300 and 3,000 MHz requires that the power density not exceed  $f(\text{MHz})/1,500$  milliwatts per square centimeter averaged over a 30-minute duration. For 1,215 MHz and 1,250 MHz the permissible exposure values are 0.81 and 0.83 milliwatts per square centimeter respectively for an average time of 30 minutes. For 1,175 MHz and 1,375 MHz the permissible exposure values are 0.78 and 0.92 milliwatts per square centimeter respectively for an average time of 30 minutes. For the purposes of this analysis, the lowest value of 0.78 milliwatts per square centimeter is used as the permissible exposure requirement. The COBRA DANE can exceed the standard for distances out to approximately 100 meters (328 feet). The area around the face of the COBRA DANE is an enclosed area within government-controlled land that is fenced to assure no unauthorized access occurs within the hazardous area.

### **3.2.8 INFRASTRUCTURE**

A general description of infrastructure elements is provided in the first paragraph of section 3.1.7.

#### **Region of Influence**

The ROI includes the utility systems that could potentially be affected by the Proposed Action.

#### **Affected Environment**

##### *Water Supply*

Potable water on Eareckson AS is collected through an infiltration gallery system and backup wells (see Section 3.2.11, Water Resources). Eareckson AS's potable water system has 25 thousand meters (82 thousand feet) of water lines and a capacity to produce 1.5 million liters per day (0.39 million gallons per day). On average there is a total base usage of 0.22 million liters per day (0.06 million gallons per day).

### *Wastewater*

Eareckson AS's sanitary sewage system has 24 thousand meters (79 thousand feet) of sewer lines and the capacity to treat 0.95 million liters per day (0.25 million gallons per day) of wastewater. On average there is a total base demand for treatment of 0.26 million liters per day (0.07 million gallons per day). The treatment plant provides secondary treatment before ocean out fall.

### *Solid Waste*

The U.S. Air Force at Eareckson AS adopted a regulation in 1991 that established policies and procedures for segregation of solid, nonhazardous waste into two main categories and several subcategories. Junk metal and aluminum cans are categorized as recyclable and are shipped off of the island. Large items such as automobiles, couches, and washing machines are also removed from the island. Heavy plastic, polyvinyl chloride, and all other municipal wastes are disposed of in the Eareckson AS landfill.

The Eareckson AS landfill is located on the southeast point of the island and has been in operation since 1944. The landfill is currently operated under State of Alaska Solid Waste Disposal Permit number 9425-BA009, which permits the disposal of municipal solid waste at the landfill. The landfill sits adjacent to an IRP site. Ground water monitoring has shown that an increase in petroleum product contamination. The Eareckson AS landfill permit expired 1 December 1999. The State of Alaska will not renew the permit, but has issued an administrative extension until a new landfill can be built. Currently, a new landfill design is being proposed for construction in an alternate location (Hostman, 2001).

### *Electricity*

Eareckson AS has six 3-MW diesel generators, only three of which are operating at any one time. Under most conditions, the three generators are run at 55 percent of their capacity, for a total of 4.95 MW. Eareckson AS has an annual usage of 28 million kW-hours.

## **3.2.9 LAND USE**

A description of land use is provided in the first paragraph of section 3.1.8.

### **Region of Influence**

The land use ROI includes the immediate work areas utilized during construction and operation of the Proposed Action facilities.

### **Affected Environment**

#### *Regional Land Use*

Eareckson AS is located on Shemya Island near the end of the Aleutian Island chain. The Aleutians West Census Area is unincorporated and has no official zoning ordinances.

However, all development will require review for consistency with the standards of the Alaska Coastal Management Program.

The area around Shemya is virtually all open ocean, with an uninhabited island about 3 kilometers (2 miles) to the west. All of the land uses in the area are compatible with the adjoining areas of Eareckson AS.

#### *Eareckson AS Land Use*

Eareckson AS consists of 1,425 hectares (3,520 acres), which is the entire island of Shemya. The island is located wholly within the USFWS-administered Alaska Maritime National Wildlife Refuge. The purposes of the Alaska Maritime National Wildlife Refuge include (1) conserving wildlife and wildlife habitat in their natural diversity, (2) fulfilling international treaty obligations of the United States with respect to fish and wildlife, (3) providing for a subsistence opportunity by local residents, (4) providing a national and international program of scientific research on marine resources, and (5) ensuring water quality and quantity within the refuge.

As mentioned earlier, the Department of the Air Force has primary jurisdiction, custody, and control over Shemya Island and its waters (including submerged lands). Shemya Island and its waters (including submerged lands) are part of the Alaska Maritime National Wildlife Refuge and the National Wildlife Refuge System, and the Secretary of the Interior has jurisdiction secondary to that of the Department of the Air Force.

The southern portion of the air station is dominated by an airfield and airfield support, which consists of support buildings and one active runway. Administrative buildings are scattered throughout the northern portion of the station. Housing is in the north central section of the base, and community and service facilities are in close proximity to the housing and administrative facilities. Industrial sites are scattered throughout the air station, with the remainder of the land being open space. Facilities associated with the airfield, the COBRA DANE Radar, and some housing and administrative accommodations are all of the facilities that are currently in use. The remainder of the facilities is currently inactive.

#### *Coastal Zone Management*

All of the communities within the Aleutians West Coastal Resource Service Area (AWCRSA) are coastal, and essentially all developable land within the AWCRSA is located in the "zone of direct influence" of the coastal environment. All major development in the AWCRSA will require review for consistency with the standards of the Alaska Coastal Management Program and the policies of the AWCRSA coastal program.

Federal lands are excluded from Alaska's coastal zone boundaries. Activities on these lands do, however, require preparation of a Coastal Zone Consistency Determination in accordance with the Coastal Zone Management Act of 1972. Any activities on Federal lands and waters that affect any land or water use or natural resource of the AWCRSA coastal zone must be consistent, to the maximum extent practicable, with the enforceable

policies of the AWCERSA coastal management program. A coastal consistency determination for proposed GMD test bed activities on Eareckson AS is included as appendix C.

### **3.2.10 NOISE**

A general description of noise is provided in the beginning of section 3.1.9.

#### **Region of Influence**

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a  $L_{eq}(1 \text{ hour})$  greater than or equal to 67 dBA.

#### **Affected Environment**

Eareckson AS is located on Shemya Island, which has no population other than personnel associated with the air station, and would be expected to have a background noise level of DNL less than or equal to 55 dBA. The closest civilian community is Atka, which is approximately 604 kilometers (375 miles) from Shemya Island.

### **3.2.11 WATER RESOURCES**

A description of water resources is provided in the beginning of section 3.1.11.

#### **Region of Influence**

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

#### **Affected Environment**

##### *Surface Water*

Eareckson AS is located in the Shemya Island watershed. Surface water flow on Eareckson AS follows the topography in a south-southwest direction, although the east and west halves of the island are distinct drainage systems. Drainage is generally poor in the interior of the island, resulting in standing water. There is no record of either rainfall induced or coastal flooding on Shemya Island. The small drainage area of the interior is not likely to result in flooding, and the coastline is sufficiently high such that 100-year storm waves would not top the beach crest. However, a tsunami line has been established at the 30-meter (100-foot) elevation mark.

Numerous lakes and ponds exist on the island, generally in the northern and western portions of the island. Except for the western Lake Complex, most of the lakes and ponds have poorly defined drainage basins. Many of the lakes and ponds are situated near

surface water divides or high points, and a significant portion of the available precipitation is absorbed by surficial and near-surface deposits. The remaining water is discharged by streams or springs on the southern coastline. There is not a large runoff on the northern coast of the island due to the increasing northern elevation.

A small watershed located in the eastern part of the island covering an area of approximately 103 hectares (255 acres) is the recharge area for potable water at Eareckson AS. Within this area, surface water infiltrates into a shallow unconfined aquifer.

Storm water flows overland and through culverts, eventually reaching outfall locations at the ocean. Outfalls usually discharge storm water mixed with groundwater that seeps into the drainage channels. Eareckson AS has an NPDES Multi-Sector Industrial Storm Water Permit and SWPPP that document existing conditions and establish practices for prevention of storm water pollution.

### *Groundwater*

Shemya Island has a relatively complex hydrogeological environment. Both confined and unconfined aquifers occur on the island, with some areas having multiple zones of saturation. Groundwater can be encountered either in the surface peat layer that occurs over much of the island, or in the unconsolidated sand and gravel that occurs primarily in the southern coastal area, or in the fractured bedrock in the central portion of the island.

Groundwater flow within the unconsolidated deposits closely follows the surface topography. Most water finds its way into the fractures in the bedrock where it is stored. The general direction of water flow within the bedrock follows surface contours. All of the potential aquifers on the island are either quite thin, have low porosity, or have low permeability. Depth to water varies from approximately 3 meters (10 feet) to more than 60 meters (200 feet) below ground surface.

Potable water is collected through an infiltration gallery system installed in the 1950s. Four horizontal infiltration collectors are installed below the peat layer of the shallow unconfined aquifer. Groundwater from the peat layer enters the collectors and flows to a central holding tank. The water is pumped to the water treatment plant, where it is treated for domestic use, chlorinated, and then pumped into three water storage reservoirs for domestic and construction uses. Two wells provide up to 416 liters (110 gallons) per minute of water as a backup to the water gallery system.

### *Water Quality*

Surface water and groundwater quality is generally good except in isolated areas of known contamination. Water pumped from the water gallery is treated in the water treatment plant before domestic use. Drinking water quality is subject to seasonal variations but is generally within established EPA drinking water standards. However, drinking water samples have exceeded the 1993 action levels for lead and copper.

### **3.2.12 ENVIRONMENTAL JUSTICE**

A general description of environmental justice is given in the beginning of section 3.1.12.

#### **Region of Influence**

The ROI for Eareckson AS consists of the Aleutians West Census Area.

#### **Affected Environment**

Based upon the 1990 Census of Population and Housing the Aleutians West Census Area had a population of 9,478. Of that total, 848 persons, or 8.95 percent, were low-income; 3,377 persons, or 35.63 percent, were minority. The nearest population center to Eareckson AS is Adak Station on Adak Island, which is approximately 365 miles to the east of Eareckson AS. As of 1999, 80 percent of the population in the Aleutians West Census Area reside in the City of Unalaska, which is located on Unalaska Island approximately 765 miles to the east of Eareckson AS.

## **3.3 EIELSON AFB, ALASKA**

Eielson AFB is located approximately 37 kilometers (23 miles) southeast of Fairbanks, and about 14 kilometers (9 miles) southeast of the city of North Pole within the Fairbanks North Star Borough. The main base consists of approximately 8,021 hectares (19,820 acres). It also manages an additional 15,098 hectares (37,309 acres) at four other locations.

Initial analysis indicated that construction and operation of a Missile Transfer Facility would not result in a substantial increase in hazardous material use or hazardous waste generation or impact to airspace.

The proposed location for the Missile Transfer Facility is a site that has been previously disturbed. No impacts to cultural resources are anticipated.

Construction of the Missile Transfer Facility would result in only a slight short-term positive impact on the economy of the region.

### **3.3.1 AIR QUALITY**

A general description of air quality is provided in the beginning of section 3.1.1.

#### **Region of Influence**

The ROI is generally limited to an area extending no more than a few tens of miles downwind from the source and includes the geographic airshed in which the emissions would occur.

## **Affected Environment**

Regional air quality is described in section 3.1.1.

### *Existing Emissions Sources*

Eielson AFB is classified as a major emissions source with emissions from boilers, engines, hush house, gas stations, chemicals, fuel handling, and miscellaneous equipment and maintains a Title V Air Permit through the ADEC. Annual emissions (1997) included the following: carbon monoxide—422 metric tons (466 tons); oxides of nitrogen—1,154 metric tons (1,272 tons); oxides of sulfur—793 metric tons (874 tons); particulate matter—311 metric tons (343 tons); and volatile organic compounds—51 metric tons (56 tons). Eielson AFB also emitted 140 metric tons (155 tons) of hazardous air pollutants.

Eielson AFB is in attainment for all NAAQS and state standards and should be evaluated as a PSD Class II area.

Although the base itself is located in an attainment area, the Fairbanks North Star Borough is in nonattainment for carbon monoxide. During episodes of cold winter weather, atmospheric inversions may trap contaminants and cause exceedances of the NAAQS or state standards. According to Fairbanks North Star Borough studies, approximately 90 percent of all carbon monoxide produced within the borough is from vehicles. Denali National Park, a Class I PSD area, is approximately 180 kilometers (110 miles) from Eielson AFB, and would be within the base's ROI.

The base recently conducted a PSD review and obtained a PSD Operating Permit that addresses emissions of nitrogen oxides. This application restricts oil-fired boilers installed after 1981 to an overall average 50-percent utility and restricts diesel engines installed since 1981 (other than the 25-MW power plant generator) to an overall average of 500 hours of operation per year. These two operating limitations avoid triggering the PSD applicability threshold for sulfur dioxide and reduce the potential-to-emit level for nitrogen oxides from engines installed since 1981.

## **3.3.2 BIOLOGY**

A general description of biological resources is provided in the first paragraph of section 3.1.2.

### **Region of Influence**

The ROI for biological resources includes the area within and adjacent to the proposed Missile Transfer Facility on Eielson AFB (figure 2-8) that could potentially be affected by the proposed activities.

## **Affected Environment**

### *Vegetation*

The vegetation of Eielson AFB, as with the Tanana River Valley and the lowlands of Interior Alaska in general, is composed of boreal (or taiga) forest. Evergreen forests of black and

white spruce dominate this habitat. The presence of black spruce and bogs usually indicates an area underlain by permafrost. There are also extensive stands of deciduous forests of paper birch, quaking aspen, and balsam poplar, which generally develop on permafrost-free soils. Figure 3-7 indicates the location of vegetation types within the proposed project area.

Semi-improved ground areas include unpaved ground within and around the airfield, tank farms, and similar facilities. Most ground is maintained by annual mowing and brush control measures. The dominant cover commonly consists of tickle grass, foxtail barley, Kentucky bluegrass, alsike clover, Canada goldenrod, and yarrow. Along the runway, common fireweed and alpine sweet-vetch are abundant. Patches of smooth brome are also common in open, seeded areas.

No population of either glaucous goosefoot (*Chenopodium glaucus*) or Alaskan paintbrush (*Castilleja annua*) was located during field surveys and neither of these plant species, considered rare by the State of Alaska, is expected to occur within the proposed project area.

#### *Wildlife*

French Creek supports spawning and rearing chum salmon, Piledriver Slough supports migrating (possibly) spawning chum salmon. Alaska Department of Fish and Game's "Catalog of Water Important for Spawning, Rearing or Migration of Anadromous Fishes" does not identify Chinook (king salmon) in these water bodies. In addition, French Creek and Piledriver Slough support resident fish, e.g., Arctic grayling, whitefish, longnose suckers, and pike. (State of Alaska, Department of Fish and Game, 2002)

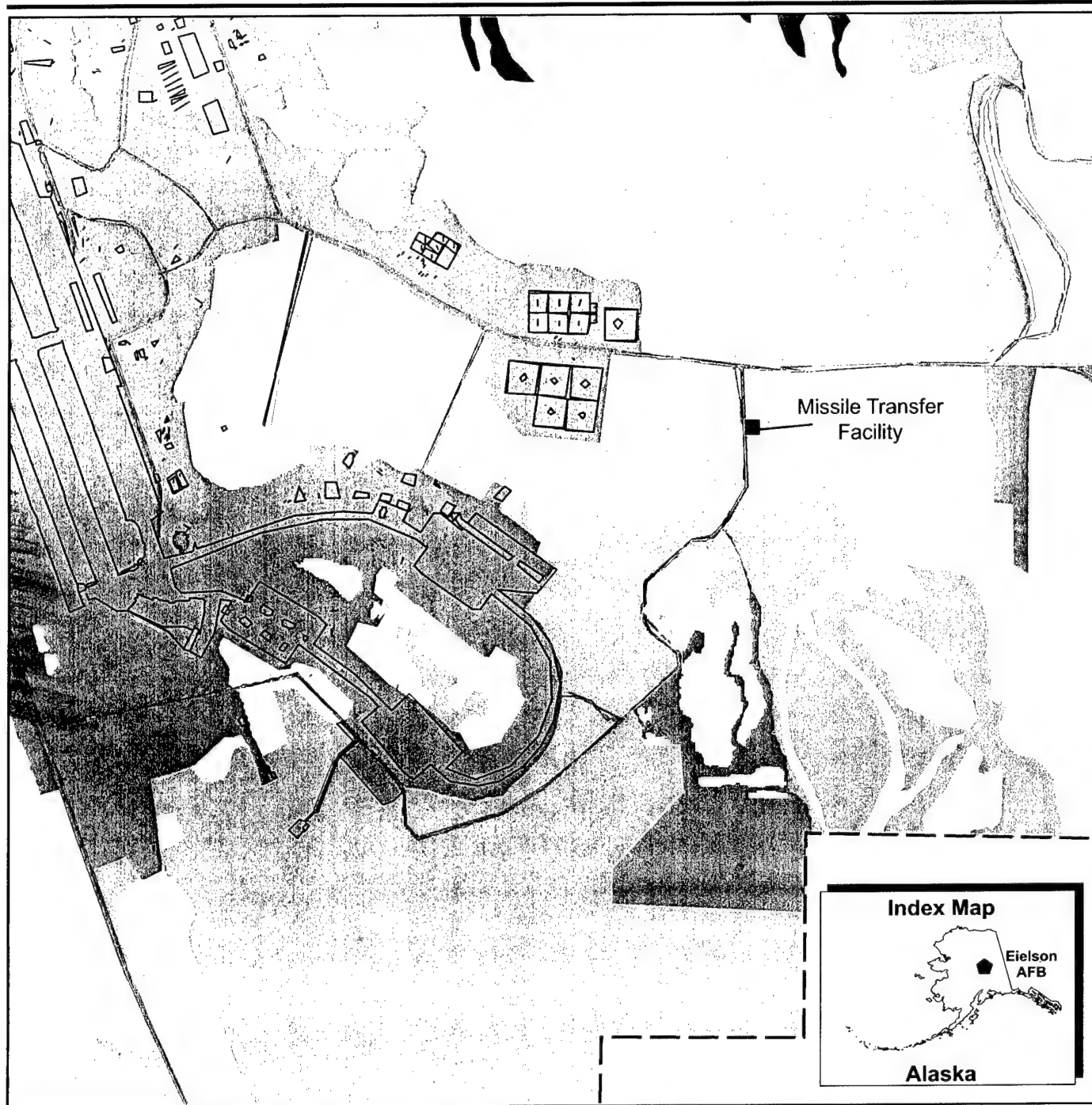
The Tanana Valley provides summer breeding habitat for a variety of migratory birds, in addition to the many year-round residents. Some of the most common species include spruce grouse, ruffed grouse, great horned owl, red-tailed hawk, sharp-shinned hawk, American kestrel, willow ptarmigan, northern goshawk, rock ptarmigan, and a wide variety of waterfowl.

Some of the more important or abundant mammal species include moose, black bear, brown/grizzly bear, snowshoe hare, marten, meadow vole, red-back vole, meadow jumping mice, red squirrel, beaver, muskrat, and mink. North American lynx are occasionally trapped on Eielson AFB.

Sporadic areas of black spruce and old field habitat border the runway and cantonment area. This habitat can support coyote, red fox, red squirrel, common raven, ruffed grouse, and a variety of waterfowl in the open water areas.

#### *Threatened and Endangered Species*

No threatened or endangered species have been identified on lands managed by Eielson AFB. The recently delisted American peregrine falcon and arctic peregrine falcon (*Falco peregrinus tundrius*) are known to occasionally pass through the base.



# EXPLANATION

- Roads
- Water Area
- Installation Boundary
- Railroads

- Human Disturbance
- Broadleaf Forest
- Mixed Forest
- Black Spruce Forest
- Fresh Sedge Marsh
- Sedge Grass Meadow
- Shrub/Birch Shrub and Serial Herb



Scale  
0 .8 1.6 miles  
0 1.25 2.5 kilometers

## Vegetation

Eielson Air Force Base, Alaska

Figure 3-7

### *Environmentally Sensitive Habitat*

No federally designated critical habitat has been identified on Eielson AFB.

Approximately 51 percent of Eielson AFB is composed of wetlands (figure 3-8). The most common type of vegetated wetlands is black spruce wetlands. Most of the wetlands on base have wet soils due to poor drainage caused by permafrost. Vegetated wetlands are located adjacent to the area proposed for use by the Proposed Action.

### **3.3.3 GEOLOGY AND SOILS**

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

#### **Region of Influence**

The ROI for geology and soils includes that area of Eielson AFB that could potentially be disturbed by construction and operations associated with the Missile Transfer Facility and connecting infrastructure.

#### *Geology*

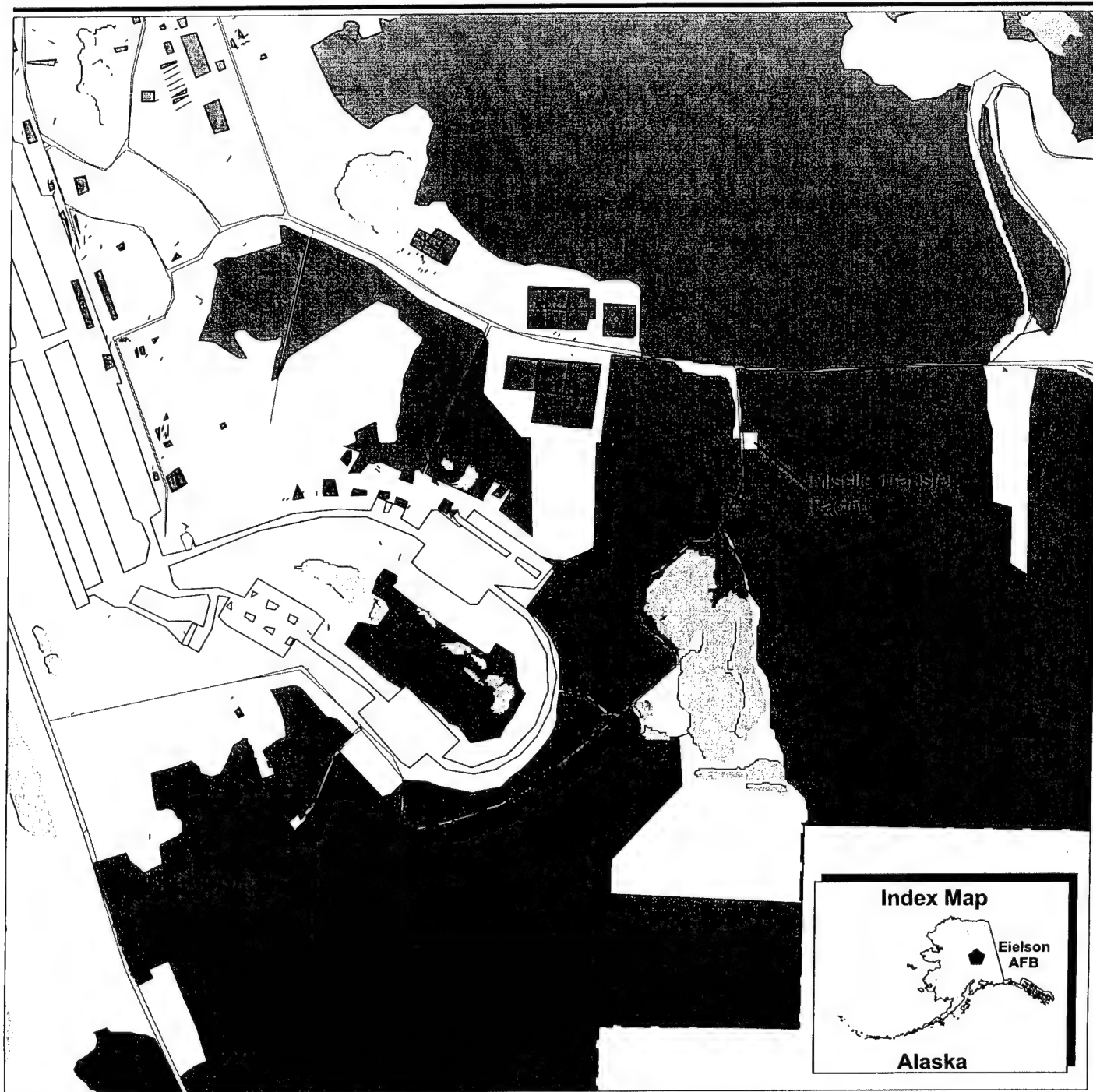
Eielson AFB is located within a large geologic province known as the Yukon-Tanana terrane. This is a region of deformed and faulted metamorphic and igneous rocks of Precambrian to Mesozoic age (800 to 66 million years B.P.), overlain by younger sedimentary formations of Tertiary and Quaternary age (65 million years to present). The Yukon-Tanana terrane is recognized as a complex assemblage of many rock types with a very complicated geologic history. The area is cut by northeast-trending, high angle faults.

During the Quaternary period, alluvial fans were deposited along the southern margin of the Tanana River Valley due to rapid uplift of the Alaska Range and northern foothills and the occurrence of at least four major glacial advances. Aggradation of the river plain built up a thick, layered sequence of unconsolidated silts, sands, and gravels in the lowlands. Unconsolidated deposits are approximately 61 to 91 meters (200 to 300 feet) beneath Eielson AFB but have been estimated to be as great as 229 meters (750 feet) just south of Fairbanks.







#### *Soils*

Soils in the Tanana Valley consist of unconsolidated silt sands and gravels, organic silts, sandy silts, and clays. Floodplain soils nearest the active channel are sandy with a thin silt loam layer on the surface. On higher terraces, the soils are predominantly silt belonging to the Salchaket series. On older river terraces, silt loam soils of the Goldstream series dominate and often have a significant organic component. These soils tend to be cold and wet and are generally underlain by permafrost. Clays, sandy silts, and sandy gravelly loams may be found in upland areas of the Tanana River Valley.

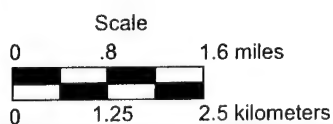
Eielson AFB is within a region of discontinuous permafrost. Preliminary geotechnical investigations at the proposed site indicate the presence of permafrost on north-facing slopes, which is typical for areas of discontinuous permafrost. The thawing of permafrost



# EXPLANATION

- |   |  |
|---|--|
|  Roads                 |  Uplands            |
|  Water Area            |  Vegetated Wetlands |
|  Railroads             |  |
|  Installation Boundary |  |

## Wetlands



Eielson Air Force Base, Alaska

Figure 3-8

in this area could result in subsidence, erosion, and gully formation. The thawing process could also affect water quality by increasing suspended sediment values if soil moved toward water bodies.

#### *Mineral Resources*

Mining activities in and around Eielson are primarily for sand and gravel extraction. Sand and gravel have been used for the construction of the Richardson Highway, Eielson AFB, and the Trans-Alaska Pipeline.

#### *Geologic Hazards*

Eielson AFB is within the Fairbanks seismic zone, a northeast-trending band of seismic activity. An average of five or six earthquakes a year are actually felt in this zone. In June 1967, a series of three earthquakes of about magnitude 6 had epicenters to the west of Eielson AFB. Two other moderate earthquakes (magnitude 4.0 to 4.6) occurred in this zone in 1977.

### **3.3.4 HEALTH AND SAFETY**

A general description of health and safety is provided in the beginning of section 3.1.6.

#### **Region of Influence**

The ROI for health and safety of personnel includes the immediate work areas utilized during construction and operation of the Missile Transfer Facility at Eielson AFB. The ROI for public safety includes properties immediately adjacent to the base and the transportation network for hazardous materials.

#### **Affected Environment**

The Eielson AFB Safety Office reviews base safety issues. Other offices, such as the Bioenvironmental Engineering Office, also ensure safe operations by providing services such as sampling of indoor air, water, and unknown material or waste. Eielson AFB maintains mutual aid agreements with the Bureau of Land Management to fight range fires and 10 local fire departments within the surrounding area. The Bureau of Land Management has the primary responsibility of fighting fires in the forested area of Eielson AFB with assistance from the base fire department. The base maintains firebreaks around hazardous areas such as ammunition storage areas and fuel storage areas.

The Eielson AFB fire department, maintains five crash trucks, three structural trucks, two water trucks, two ramp vehicles, two command vehicles, and one hazardous material truck. The base currently has personnel who administer and manage the program for both the flightline and the base facilities. Two fire stations, one along the flightline and the second in the base housing area, provide the base fire protection needs. The positioning of these facilities meets the U.S. Air Force time and distance requirements for facility response.

The threats to human safety from aircraft accidents at Eielson AFB are summarized in the Air Installation Compatible Use Zone (AICUZ) Report. The AICUZ guidelines are based on the type of aircraft at the base and the nature of operations conducted. In order to minimize the risk to the public at each end of the runway, a Clear Zone and two Accident Potential Zones have been designated. The Clear Zone, the area where aircraft mishaps are most likely to occur, is contained within the base boundaries.

Other on-base safety restrictions include ESQDs associated with current operations. There are no electromagnetic radiation (EMR) safety zones on Eielson AFB.

### **3.3.5 INFRASTRUCTURE**

A general description of infrastructure components is provided in the first paragraph of section 3.1.7.

#### **Region of Influence**

The ROI for infrastructure is made up of the service areas of each utility provider servicing the base.

#### **Affected Environment**

##### *Solid Waste*

In 1998 Eielson AFB produced an estimated 4.0 thousand metric tons (4.4 thousand tons) of solid waste. Of that, an estimated 3.0 metric tons (3.3 thousand tons) was transferred to the Fairbanks North Star Borough landfill, 0.76 thousand metric tons (0.83 thousand tons) of combustible waste was used as fuel at the Eielson AFB Refuse Derived Fuel facility, and the rest was recycled or composted.

**Off-base.** The Fairbanks North Star Borough Landfill has been in operation for approximately 30 years. The newest cell is currently under construction and is anticipated to be in operation within the next year. The landfill can accept asbestos-contaminated waste, household hazardous waste, and waste from conditionally exempt small quantity hazardous waste generators. No other hazardous or radioactive waste can be accepted at the landfill.

It is estimated that the landfill accepts approximately 73 thousand metric tons (80 thousand tons) of waste annually, the majority of which comes from the Fairbanks North Star Borough (which includes both North Pole and Fairbanks). However, they do occasionally accept waste from other boroughs.

##### *Energy*

**Electricity and Steam—On-base.** The Central Heat and Power Plant is the most critical facility on Eielson AFB, as it is the base's primary source for heating and electric power. Operating continuously, year round, it has an annual production of approximately 860 million kilograms (2 billion pounds) of steam and 89 million kilowatt-hours of electricity.

With arctic temperatures dipping as low as -51°C (-60°F), reliable steam heat is critical to operations at Eielson AFB.

Electrical power on Eielson AFB is generated by a series of steam turbine generators in the Central Heat and Power Plant. The base is electrically self-sufficient, except for Charlie Battery, Pedro Dome, Birch Lake, and Flag Hill. All of these areas receive their electricity from Golden Valley Electric Association.

The Central Heat and Power Plant is equipped with five steam turbine generators capable of producing 25 MW of electricity. Eielson AFB also has a contract with Golden Valley Electric Association that allows the base to access 10 MW of power whenever needed.

Power demand varies seasonally, with peak winter demands of approximately 17 MW. In fiscal year 1997, Eielson AFB purchased 13.3 million kW-hours of electricity from Golden Valley Electric Association and produced approximately 89 million kW-hours themselves.

Each of the Central Heat and Power Plant's boilers has a maximum rating of 54 thousand kilograms (120 thousand pounds) of steam per hour. The normal operating range for the boilers is between 27 thousand and 32 thousand kilograms (60 thousand and 70 thousand pounds) of steam per hour. During the summer months, only two boilers are needed for electrical generation. During winter operations, four to five boilers are required to meet the heating load.

### **3.3.6 LAND USE**

A general description of land use is provided in the first paragraph of section 3.1.8.

#### **Region of Influence**

The ROI for land use includes those areas potentially affected by the use of facilities and infrastructure at Eielson AFB for the construction and operation of a Missile Transfer Facility.

#### **Affected Environment**

Eielson AFB main base encompasses approximately 8,021 hectares (19,820 acres). It manages another 15,098 hectares (37,309 acres) at four other offsite locations. The land uses at Eielson AFB consist of the airfield, airfield operations, industrial, administration, community facilities, medical facilities, housing, recreational, and open space areas.

The airfield land use is the dominant land use category on the base, and consists of the runway, taxiways, and parking/maintenance/armoring aprons. Airfield operations are located adjacent to the airfield to the east along Flightline Avenue and essentially coexist with the airfield operations. The main industrial area is located in the central section of the base just east of the airfield operations area. Other industrial areas are scattered in the eastern section of the base and on Engineer Hill.

Military personnel and the general public use Eielson AFB for various recreational activities. These activities include hunting, fishing, trapping, camping, cross-country skiing, snowmobiling, archery, and firing ranges. Some facilities and recreation areas on base are limited to military personnel, retired military, DoD civilians, and their bona fide guests.

### **3.3.7 NOISE**

A general description of noise resources is provided in the beginning of section 3.1.9.

#### **Region of Influence**

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a  $L_{eq}(1 \text{ hour})$  greater than or equal to 67 dBA.

#### **Affected Environment**

The area surrounding Eielson AFB is sparsely populated, and thus expected to have a background noise level of DNL less than or equal to 55 dBA.

Aircraft noise at Eielson AFB occurs during aircraft engine warm-up, maintenance and testing, taxiing, takeoffs, approaches, and landings. Noise contours for aircraft operations were modeled for the Eielson AICUZ Study and updated in 1996.

The noise contour with a DNL value of 65 dBA was estimated to occur outside the base boundaries on land off the northern end of Runway 31. The community of Moose Creek, which has low-density housing, falls within this contour. The highest DNLs occur on the runway and taxiways and were measured at 85 dBA. The loudest noise contours were estimated to have a DNL value of 85 dBA and to surround the majority of the airfield's primary surface.

The main highway in the vicinity of Eielson AFB is the Richardson Highway. At the North end of Eielson AFB the Richardson Highway is a four-lane divided highway, which provides access to the base through the Hursey Gate. At the south end of the installation, the highway is a two-lane highway. The transition from a four-lane divided highway to a two-lane highway occurs south of the Hursey Gate. This gate is the only operational gate at Eielson allowing access to and from the installation. The summer average daily traffic count for the Richardson Highway in the vicinity of the base is 10,461. Assuming an even division of the traffic (i.e., 5,230 on each side of the divided highway), traffic noise levels of  $L_{eq}(1 \text{ hour})$  equals 72 dBA,  $L_{eq}(1 \text{ hour})$  equals 67 dBA, and  $L_{eq}(1 \text{ hour})$  equals 57 dBA are estimated to occur at approximately 15 meters (49 feet), 32 meters (105 feet), and 150 meters (492 feet) from the highway, respectively. For the purpose of analysis, the traffic speed was assumed to be 89 kilometers (55 miles) per hour.

Other than the community of Moose Creek, no noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of Eielson AFB.

### **3.3.8 WATER RESOURCES**

A general description of water resources is provided in the beginning of section 3.1.11.

#### **Region of Influence**

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

#### **Affected Environment**

##### *Surface Water*

The Eielson ROI is located primarily in the Tanana Flats watershed and also extends into the Chena River watershed. Surface water bodies near Eielson AFB include rivers, creeks, sloughs, lakes, and ponds. Surface drainage at Eielson AFB is generally north-northwest, parallel to the Tanana River. Moose Creek is the main receiving stream for small local drainages around the base. Garrison Slough passes directly through the developed portion of the base and consists primarily of engineered drainage channels. Moose Creek discharges into Piledriver Slough just above the confluence with the Tanana River. With the exception of a short period during spring, the surface water elevation in Garrison Slough is lower than the groundwater elevations.

Approximately 34 percent of Eielson AFB is within the 100-year floodplain. Eielson AFB operates under an NPDES Multi-Sector Industrial Storm Water Permit and SWPPP. The SWPPP identifies existing and potential sources of storm water pollution at Eielson AFB and defines Best Management Practices (BMPs) to reduce potential pollution and ensure compliance with permit requirements.

##### *Groundwater*

Groundwater on the developed part of the base occurs at depths of 2 to 3 meters (6 to 10 feet) below ground surface. This is an unconfined aquifer associated with the Tanana River floodplain. The aquifer is 61 to 91 meters (200 to 300 feet) thick and overlies the Birch Creek Schist. Flow directions are usually to the north-northwest and parallel the flow of the Tanana River. Local variations in flow directions occur on Eielson AFB near surface water bodies, Power Plant pumping supply wells, and near melting piles of stored snow that create a source of recharge water during breakup.

Groundwater elevations in the unconfined aquifer are subject to seasonal fluctuations, with the highest elevation occurring during and immediately following snowpack melting. The lowest elevations are expected during the fall. During winter, a slow rise in water levels is normal. The magnitude of fluctuations varies from year to year, but generally is in the range of 0.5 to 0.6 meter (1.5 to 2.0 feet).

Groundwater in the upland portion of the base occurs at depths of approximately 15 to 91 meters (50 to 300 feet) in a fractured bedrock aquifer. Downgradient flowpaths are not well defined in this aquifer. Groundwater flow in the bedrock aquifer is controlled largely by the heterogeneities in the bedrock such as fractures or relatively permeable lenses and layers.

Groundwater is the only source of potable water used at Eielson AFB. Additional private and agricultural wells are located within a 5-kilometer (3-mile) radius of the base. These wells are located downgradient, north-northwest, and to the west of the base. Groundwater is also utilized for emergency and firefighting purposes on Eielson AFB.

#### *Water Quality*

Background groundwater quality analyses have shown that the average iron and manganese concentrations typically exceed the secondary maximum contaminant levels for drinking water. Arsenic has been identified as a constituent of concern at Eielson AFB, and one background sample exceeded the primary drinking water standard of 50 micrograms per liter.

### **3.3.9 ENVIRONMENTAL JUSTICE**

A general description of environmental justice is given in the beginning of section 3.1.12.

#### *Region of Influence*

The ROI includes the Census Area (the Fairbanks North Star Borough), CDPs (Eielson, Fox, Harding Lake, Moose Creek, Pleasant Valley, Salcha, and Two Rivers), and cities (Fairbanks, and North Pole).

#### **Affected Environment**

Based upon the 1990 Census of Population and Housing, the Fairbanks North Star Borough had a population of 77,720. Of that total, 5,891 persons, or 7.58 percent were low-income, and 15,256 persons, or 19.63 percent, were minority. However, this borough covers a broad area.

## **3.4 BEALE AFB, CALIFORNIA**

Beale AFB has one of only three operating EWR sites in the United States. Beale AFB currently supports the U.S. Air Force's ongoing early warning and space-tracking missions. The U.S. Air Force, which operates and has real property accountability over the EWR facilities, has initiated the process for a separate NEPA analysis to determine the long-term status of all of the EWRs in the United States. The U.S. Air Force may not complete its NEPA analysis for several years. Upgrades to the Beale AFB to support the test function of validating the GMD operational concept would not foreclose any action the U.S. Air Force determined to be appropriate, after completing its NEPA analysis. Cultural resources and

health and safety are the only resources that have the potential to be impacted by the upgrades and use required for the GMD VOC test site; therefore other resource areas are not analyzed in this document.

### **3.4.1 CULTURAL RESOURCES**

A general description of cultural resources is located in the beginning of section 3.1.3.

#### **Region of Influence**

The ROI for cultural resources at each location encompasses all buildings or structures requiring modification or renovation.

#### **Affected Environment**

The PAVE PAWS radar at Beale AFB became operational in 1980. Thus, the site is considered part of the Cold War military mission. The U.S. Air Force has initiated consultation with the California SHPO and is currently in the process of having a programmatic agreement signed before providing recently completed Level 1 recordation (i.e., photographs, narrative, drawings) HABS/Historic American Engineering Report (HAER) documentation to the SHPO (Jerry, 2001).

### **3.4.2 HEALTH AND SAFETY**

A general description of health and safety is provided in the beginning of section 3.1.6.

#### **Region of Influence**

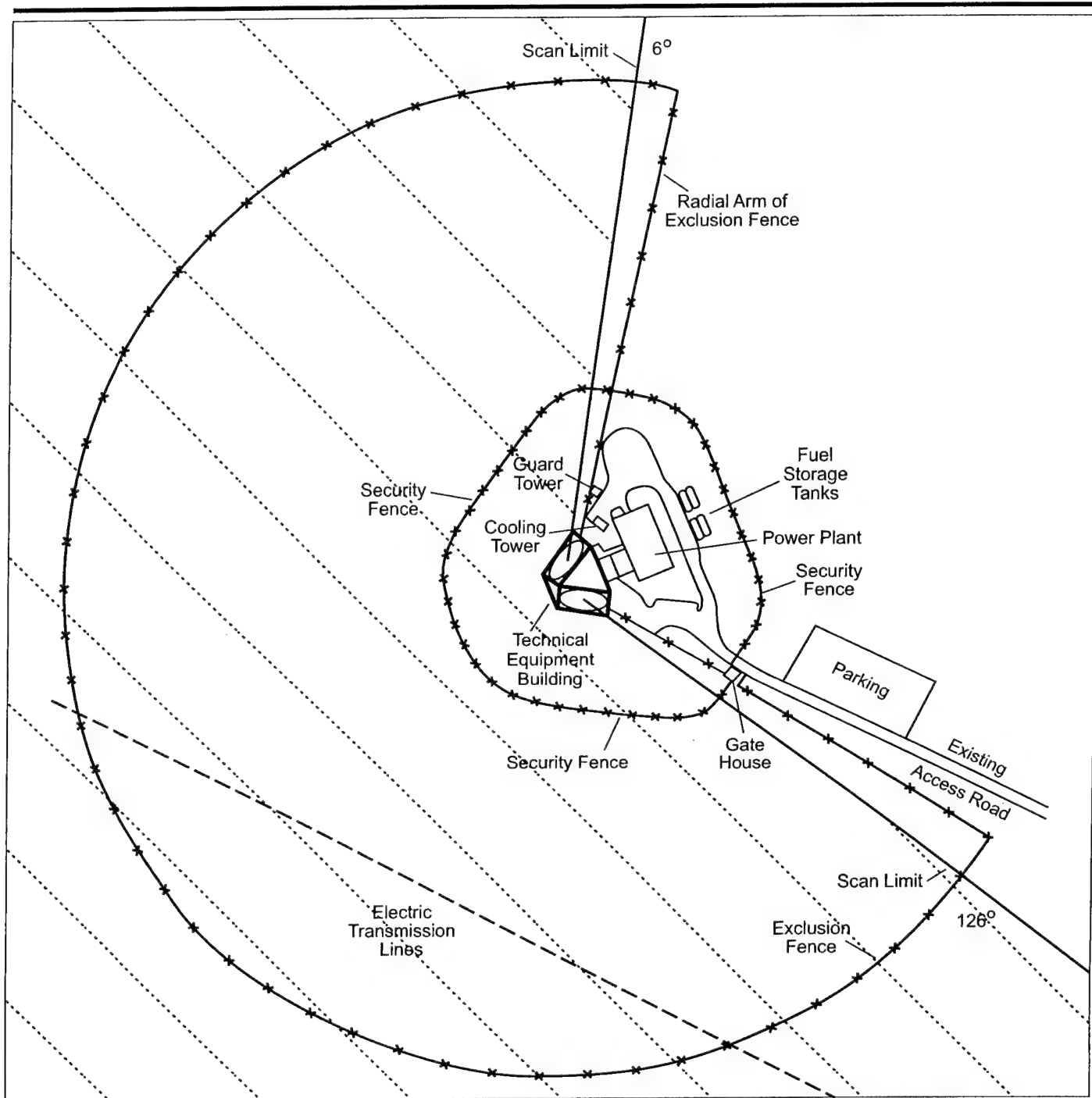
The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action.

#### **Affected Environment**


The PAVE PAWS site is located at Beale AFB, California, at coordinates 39.1 degrees north, 121.3 degrees west. The radar face bore sights (relative to true north) are at 306 and 186 degrees for face A (north face) and B (south face), respectively. The radar's scan limits are  $\pm 60$  degrees of the bore sights. The overall scan coverage is from 126 degrees clockwise to 6 degrees.

Figure 3-9 shows the PAVE PAWS Beale site layout. The exclusion fence is located approximately 305 meters (1,000 feet) from the array of radar elements. The security fence is located approximately 61 meters (200 feet) perpendicular to the bottom edges of the two array faces.

The Beale AFB PAVE PAWS site is at an elevation of 113 meters (372 feet) above sea level. There are several hills to the north of the radar site. The terrain falls off in elevation to the south and west of the radar site.



## EXPLANATION

 Scan area / direction out to approximately 5,550 kilometers (3,000 nautical miles)

## PAVE PAWS Radar and Power Plant Buildings

Beale AFB, California

Figure 3-9



0 165 329 feet  
0 50 100 meters

02-09-02 beale001 3-9

### **3.4.3 ENVIRONMENTAL JUSTICE**

A general description of environmental justice is given in the beginning of section 3.1.12.

#### **Region of Influence**

The ROI for Beale AFB is the Beale AFB CDP.

#### **Affected Environment**

Based upon the 1990 Census of Population and Housing, the Beale AFB CDP has a population of 6,912 persons. Of that population, 510 persons, or 7.38 percent were considered low-income, and 1,860 persons, or 26.91 percent, were minority.

## **3.5 DELTA JUNCTION, ALASKA**

A construction contractor mancamp could be established in the City of Delta Junction on private or City-owned cleared or leased land. No data is currently available on its actual location. Construction and operation of the mancamp would follow all applicable environmental regulations and would be performed in accordance with all required permits to minimize the potential of adverse impacts to the environment. The affected environment of the local infrastructure and socioeconomics are addressed below.

### **3.5.1 INFRASTRUCTURE**

Infrastructure addresses those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

#### **Region of Influence**

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

#### *Water*

Households in the Delta Junction area maintain individual wells with depths ranging from 46 meters (150 feet) to 110 meters (350 feet). A community water purification plant is not feasible due to the dispersed nature of the area's populace and businesses.

#### *Wastewater*

Businesses and residences are dispersed over a large area, so a community wastewater treatment system is not practical. Instead, each household maintains a septic system.

### *Solid Waste*

The city-owned Class III landfill in the Delta Junction area is leased to a private collection company, Delta Sanitation. An Alaska Class III Municipal Solid Waste Landfill is a landfill that is not connected by road to a Class I landfill or, if connected by road, is located more than 80 kilometers (50 miles) from a Class I landfill, and that accepts, for disposal, ash from incinerated municipal waste in quantities less than 1 metric ton (1 ton) daily on an annual average, which ash must be free of food scraps that might attract animals; or less than 5.1 metric tons (5 tons) daily of municipal solid waste, based on an annual average, and is not located in a place where public access is restricted, including restrictions on the right to move to the place and reside there; or that is provided by an employer and that is populated totally by persons who are required to reside there as a condition of employment and who do not consider the place to be their permanent residence.

The current landfill started as a pit with an area of 37 square meters (400 square feet) and a depth of 4.6 meters (15 feet) that was dug in 1984. The total landfill area is approximately 16 hectares (40 acres) bordered by a 30-meter (100-foot) greenbelt of black spruce and birch. The landfill is fenced to deter bears from entry. Delta Sanitation collects up to approximately 76 cubic meters (100 cubic yards) of municipal waste per week from Delta Junction and the outlying areas. This waste is then burned in large "burn boxes" (large incinerators). The resulting ash is then dumped into the landfill pit. Large household waste is also disposed of at the landfill pit. The pit is currently one-third full and has capacity for another 9 to 12 years of use at the current rate. Next to the landfill an additional 32 hectares (80 acres) of land is available for purchase. There is no provision for asbestos-contaminated materials or hazardous waste of any sort. There is limited capacity for clean construction waste.

The ADEC, in coordination with the city council and Delta Sanitation, is in the process of determining what changes will be required to the current solid waste disposal program. No specific changes have been determined, and no specific date of change has been established. However, since the waste disposal program now in effect is not standardized, it is likely that changes of some sort will be instituted.

### *Electricity and Steam*

The Golden Valley Electric Association is a non-profit, member-owned cooperative that provides electrical service to the Fairbanks North Star Borough, the Denali Borough, unincorporated areas between these two boroughs, and along the Richardson Highway to Fort Greely. Golden Valley Electric Association provides electricity to approximately 90,000 people from over 36,000 service locations.

The Golden Valley Electric Association has a generating capability of 224 MW of power, with an additional 70 MW available through the existing Fairbanks/Anchorage intertie. In 1996, they had a peak demand of 134.1 MW and total energy sales of 653 million kW. In 1997 their peak demand was 163 MW.

### **3.5.2 SOCIOECONOMICS**

Each construction contractor would provide housing for its personnel, most likely in the vicinity of Delta Junction. Use of existing housing and motels in Delta Junction as well as establishing a mancamp there could result in cumulative socioeconomic impacts, and information on this resource is provided.

#### **Region of Influence**

The ROI for socioeconomics includes Delta Junction.

Delta Junction is contained within the Southeast Fairbanks Census District and is part of the Greely-Delta economic region. There is no well defined political or geographic boundary in this region because most of it is unincorporated.

#### **Affected Environment**

Delta Junction is about 16 kilometers (10 miles) north of Fort Greely. The area is sparsely populated with an economy dependent on Fort Greely, state employment, some agriculture and Alyeska Pipeline Services.

A Reuse Plan was produced in order to help the local community prepare for the realignment of Fort Greely that identified two alternatives for the reuse of Fort Greely: a mixed use industrial complex anchored by military, institutional, and industrial uses that could generate up to 600 jobs and a minimum threshold of post operations without a major institutional facility as an anchor that would generate up to 66 jobs. However, in May 2001, the City of Delta Junction notified the Department of the Army that it would not be submitting an Economic Development Conveyance application for surplus portions of Fort Greely. The City would continue its efforts toward joint use of the Allen Army Airfield and continue to work with U.S. Army, Alaska. (City of Delta Junction, 2001)

#### *Population*

The population of Delta Junction according to the 2000 Census is 840 (State of Alaska, 2001)

#### *Employment*

The total employment of Delta Junction in 2000 was 288. Other major employers are the Delta/Greely School District and Alyeska Pipeline Services. A number of small businesses and state and Federal highway maintenance are also sources of employment (State of Alaska, 2001)

#### *Retail Sales*

Retailing within the ROI is limited to small convenience stores, usually combined with a gas station, and tourism-related retailing, including bars and restaurants. The nearest variety retailing center to the ROI is Fairbanks.

### *Income*

Delta Junction had the second highest median income of the three communities that are closest to Fort Greely. It also had the second highest proportion of residents living below the poverty level.

### *Housing, Education, and Health*

Delta Junction has a limited number of rooms in motels, apartments with daily rentals, and bed and breakfasts.

The total number of housing units in Delta Junction is 413, with 168 vacancies (State of Alaska, 2001). Four schools are located in Delta Junction with a student enrollment of 491. Delta Junction has a family medical center. The nearest hospital is 153 kilometers (95 miles) away at Fairbanks.

### *Fiscal Condition*

Delta Junction raised \$150,000 of revenue in 1997 from local service charges and external, state sources. It spent almost \$184,000 in the same year, the majority on public safety, roads, parks, and recreation. Delta Junction does not levy a bed tax on temporary accommodation.

## **3.5.3 ENVIRONMENTAL JUSTICE**

A general description of environmental justice is given in the beginning of section 3.1.12.

### **Region of Influence**

The ROI for environmental justice includes Delta Junction, which is within the Southeast Fairbanks Census Area.

### **Affected Environment**

Based upon the 1990 Census of Population and Housing, the city of Delta Junction had a population of 651 persons. Of that total, 55 persons or 8.45 percent were low-income, and 61 persons, or 9.37 percent were minority.

## **3.6 CLEAR AFS, ALASKA**

Clear AFS is about 126 kilometers (78 miles) southwest of Fairbanks in the Denali Borough near the community of Anderson. The site currently consists of approximately 4,760 hectares (11,542 acres).

### **3.6.1 AIR QUALITY**

A general description of air quality is provided in the beginning of section 3.1.1.

Clear AFS has a continental or subarctic climate, characterized by long cold winters, short mild summers, and significant changes in the daily pattern throughout the year. The climate and meteorology presented in section 3.2.1 apply to Clear AFS and its immediate environment. Clear AFS is in attainment for all NAAQS and state standards and should be evaluated as a PSD Class II area. Denali National Park is a Class I PSD area, approximately 40 kilometers (25 miles) south of Clear AFS. It would be within the base's air quality ROI. All other areas within the ROI are Class II for PSD determination purposes.

#### **Region of Influence**

For inert pollutants (all pollutants other than ozone and its precursors, nitrogen oxide and Reactive Organic Compounds), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source.

#### **Existing Emissions Sources**

Clear AFS operates under a Title V Air Permit. The station generates its own energy through a series of coal-fired steam turbine generators. The steam generated is also used for heating a portion of the base. Smaller fuel-oil furnaces are used in those areas not heated by the power plant's steam. Emergency power is provided through a series of diesel-fuel generators. There is also an emergency water pump to maintain the availability of water on Clear AFS. The cafeteria operates a solid waste incinerator to dispose of dry waste generated from cafeteria operations packaging. Various shops and operational sites on-station generate a variety of hazardous air pollutants and volatile organic compounds, which may act as ozone precursors. The emissions inventory (1997) included the following: carbon monoxide—178 metric tons (196 tons); oxides of nitrogen—487 metric tons (537 tons); oxides of sulfur—239 metric tons (263 tons); PM-10—57 metric tons (63 tons); and volatile organic compounds—4 metric tons (5 tons). Clear AFS also emitted 49 metric tons (54 tons) of hazardous air pollutants. As such, Clear AFS is a major source of hazardous air pollutants.

### **3.6.2 BIOLOGICAL RESOURCES**

A general description of biological resources is provided in the first paragraph of section 3.1.2.

#### **Region of Influence**

The ROI for biological resources includes the area within and adjacent to the sites on Clear AFS that could potentially be affected by the Proposed Action.

## **Affected Environment**

### *Vegetation*

The predominant vegetative cover on proposed Site A is tall aspen forest that shows evidence of fire. Small areas of gravel barren are also present along the southern edge of this site. Vegetation at proposed Site B consists mainly of aspen-black spruce forest, black spruce forest and woodland, and aspen-birch forest. Figure 3-10 indicates the location of plant cover types within the proposed project area. A variety of grasses, sedges, and willows are located at both sites.

IDT Site 1 is located in an area composed of aspen-birch forest and black spruce forest and woodland. IDT Site 2 is in an area composed of aspen-black spruce forest. IDT Site 3 is located within an area composed of aspen-birch forest and floodplain deciduous and white spruce forest.

Gravel barren communities are not common in central Alaska but are present in much of the western portion of Clear AFS. Gravel barrens, characterized by dry meadows and dwarf woodlands, tend to occur where the fine soil cap is nearly absent. The community supports a variety of lichens and mosses at ground level and scattered black spruce and white spruce.

### *Wildlife*

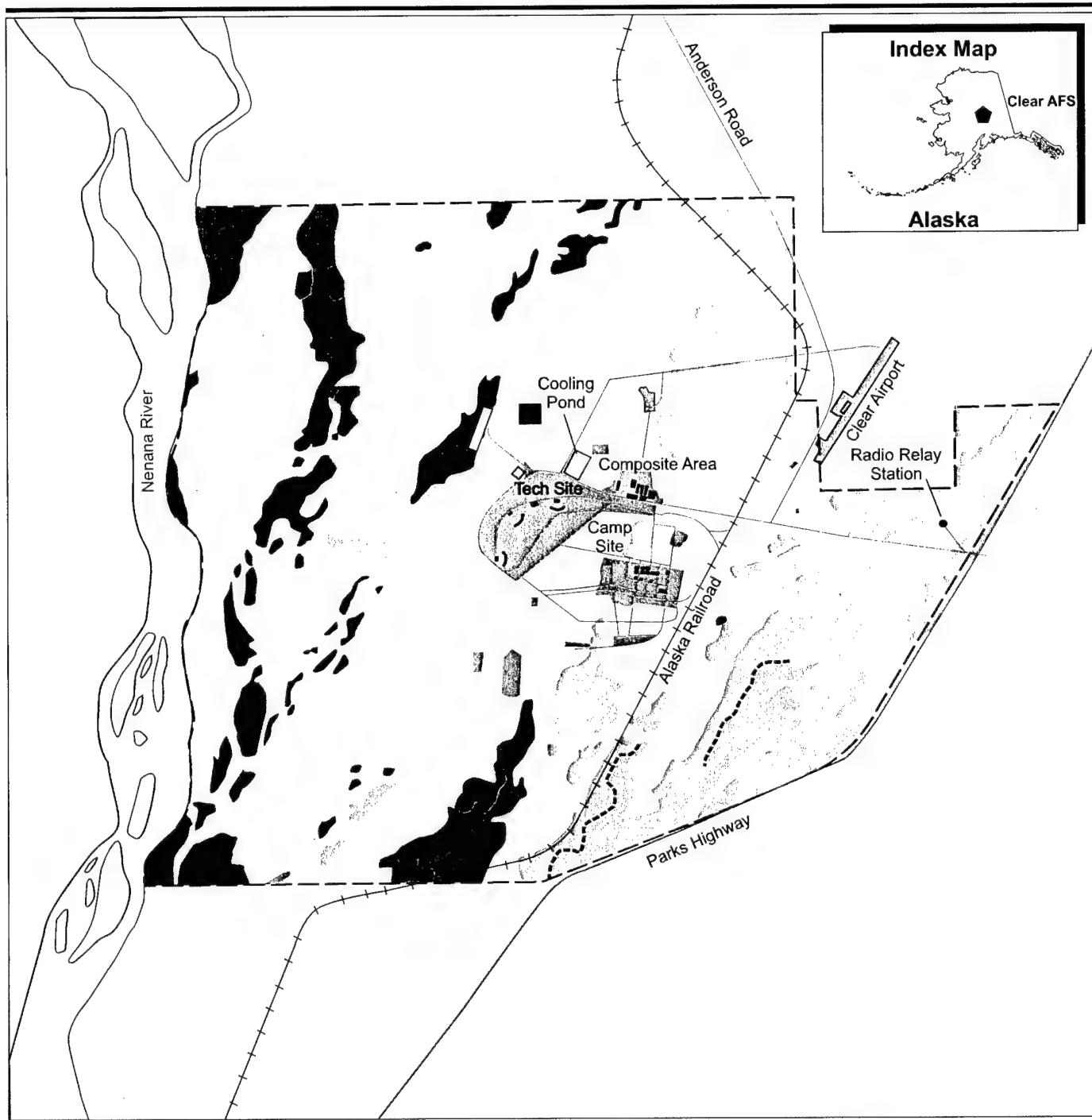
The wildlife at Clear AFS is typical of the fairly undisturbed nature of the station and its vicinity. Mammals commonly observed throughout the area include red fox, coyote, black bear, brown/grizzly bear, snowshoe hare, red squirrel, porcupine, mink, marten, beaver, muskrat, and moose. Clear AFS provides foraging, migrating, and nesting habitat for a variety of bird species. Birds commonly observed include ruffed grouse, Canada goose, mallard, cliff swallow, American robin, yellow-rumped warbler, and dark-eyed junco.

The Nenana River forms the west boundary of Clear AFS and is designated an anadromous stream. This portion of the Nenana River supports chinook, coho, and salmon (migration) along with resident fish (e.g. Arctic grayling, whitefish, pike). Coho salmon spawning areas have been documented approximately 4.82 kilometers (3 miles) downstream on the Nenana River. Lost Slough (branches off of the Nenana River at the northwest corner of the boundary) and many of its tributaries are documented as spawning areas for chinook, coho, and chum salmon. (State of Alaska, Department of Fish and Game, 2002)

The Nenana River valley, which lies within the Tanana River Basin, is an important migratory route for waterfowl and other birds. Species observed during migration include sandhill crane, Canada goose, belted kingfisher, numerous swallows and warblers, red-tailed hawk, American kestrel, great horned owl, spotted sandpiper, and green-winged teal.

### *Threatened and Endangered Species*

No Federal or state listed threatened, endangered, or candidate species of vegetation or wildlife are found at Clear AFS. No Federally designated critical habitat has been identified



#### EXPLANATION

- Roads
- Water Area
- Installation Boundary
- Railroads
- Linear Aspen and Birch Forest
- Phased-Array Radar

- Human Disturbance
- Aspen-Birch Forest
- Aspen-Black Spruce Forest
- Black Spruce Forest and Woodland
- Spruce Woodland on Gravel
- Gravel Barrens and Floodplain
- Floodplain Deciduous and White Spruce Forest

#### Vegetation



0 2,500 5,000 feet  
0 762 1,524 meters

Clear Air Force Station, Alaska

Figure 3-10

on Clear AFS. Protected bird species, including the recently delisted peregrine falcon, may migrate through the area.

#### *Environmentally Sensitive Habitat*

No federally designated critical habitat has been identified on Clear AFS.

Wetlands cover approximately 9.5 percent of Clear AFS (444 hectares [1,096 acres]). Most of these wetlands are classified as riverine wetlands and occur along the channel of the Nenana River. The remaining wetlands include palustrine (non-flowing water) wetlands. Wetlands within or adjacent to potential GBI VOC test sites are shown in figure 3-11.

A small area (2.7 hectares [6.6 acres]) of palustrine scrub/shrub, broad-leaved deciduous (PSS1) wetlands is located within the area proposed for the location of Site A, less than 1 percent of the wetlands on Clear AFS. These PSS1 wetlands are considered to be "low value" by the U.S. Army Corps of Engineers since they do not contribute significantly to the local diversity of fish, flood control, or sediment retention, but do provide habitat for wildlife. Proposed Site B is located within an area where PSS1 wetlands are more prevalent, approximately 55 hectares (135 acres) or approximately 12 percent of the wetlands on Clear AFS.

The gravel barrens located on Clear AFS may be considered as unusual communities since they do not normally occur in central Alaska. While possessing unique plants, there is no evidence that gravel barrens provide critical habitat for wildlife.

### **3.6.3 CULTURAL RESOURCES**

A general description of cultural resources is provided in the beginning of section 3.1.3.

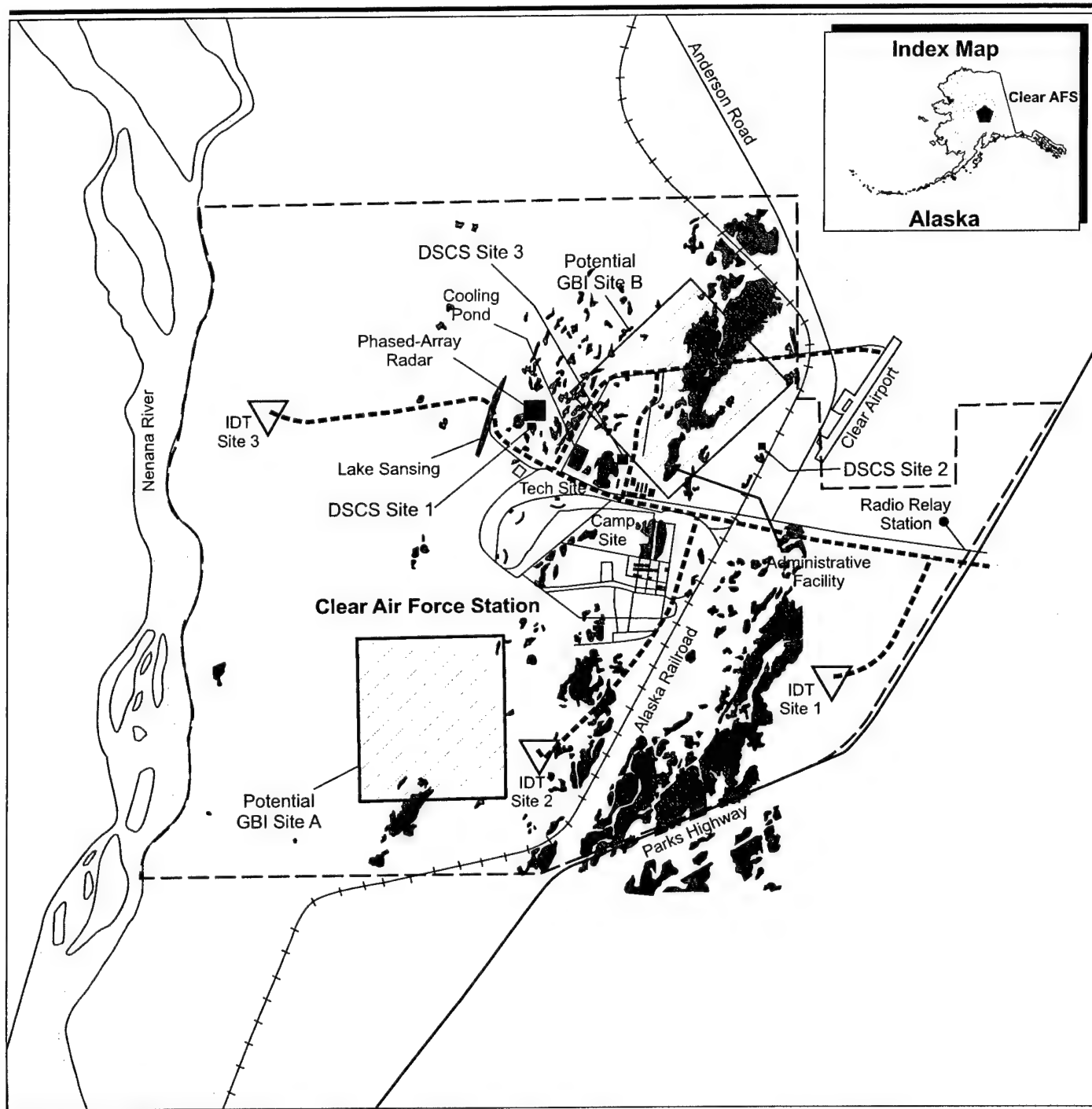
#### **Region of Influence**

The term ROI is synonymous with the "area of potential effect" as defined under cultural resources regulations, 36 Code of Federal Regulations (CFR) 15 Part 800.16(d). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. The currently defined ROI for Clear AFS includes construction sites and any other areas where ground disturbance could occur (e.g., utility corridors, roads, or runway modifications).

#### **Affected Environment**

##### *Prehistoric and Historic Archaeological Resources*

Archaeological evidence indicates that the region around Clear AFS has been occupied for about 12,000 years. Although no specific sites have been found within the boundary of the installation, sites in nearby locations have been dated to that time frame.



## EXPLANATION

- Roads
- Water Area
- Wetlands\*
- Installation Boundary
- Railroads

----- Fiber Optic Cable (FOC) Route

\* Note: This figure only depicts wetlands within or adjacent to potential GBI sites and is not inclusive of all wetlands on Clear AFS.



0 2,500 5,000 feet  
0 762 1,524 meters

## Wetlands

Clear Air Force Station, Alaska

**Figure 3-11**

A 1991 survey identified no prehistoric archaeological sites and recorded two historic archaeological sites (a railroad camp and a portion of the Alaska Railroad bed), both of which have been determined to be potentially eligible for inclusion in the National Register.

An additional survey in 1994 (covering over 809 hectares [2,000 acres]) of the installation to build upon the previous survey and provide a basis for a Cultural Resources Management Plan also identified no prehistoric archaeological sites.

The currently defined ROI has not been surveyed for prehistoric or historic archaeological resources. As described in the Cultural Resources Management Plan, the entire ROI is situated within the area determined by Northern Land Use Research to be of low archaeological potential (and requiring no further studies); the Alaska State Historic Preservation Officer has concurred with these findings.

#### *Historic Buildings and Structures*

In 1995, an inventory and evaluation of Cold War-era properties at 21<sup>st</sup> Space Wing installations identified eight Ballistic Missile Early Warning System buildings/structures at Clear AFS as potentially eligible for listing in the National Register, and the Alaska SHPO has concurred.

The currently defined ROI for cultural resources at Clear AFS is devoid of standing buildings and structures.

#### *Native Populations/Traditional Resources*

Clear AFS is located within the traditional territory of the Nenana-Toklat band of the Lower Tanana Athapaskan Indians. Athapaskan bands used the area seasonally for hunting moose and small game animals. No Alaska Native traditional cultural properties have been identified within the boundary of Clear AFS.

#### *Paleontological Resources*

Most of Clear AFS is situated within a broad glaciofluvial outwash plain composed of sandy gravel; portions of the ROI may be underlain by permafrost.

Although no paleontological remains have been recorded within the boundary of the installation, evidence of several forms of extinct animals has been found in the vicinity.

### **3.6.4 GEOLOGY AND SOILS**

A general description of geology and soils is provided in the first paragraph of section 3.1.4.

## **Region of Influence**

The ROI for geology and soils includes that area that could potentially be disturbed by construction and operation activities associated with the GBI field, BMC3, related facilities, and connecting roads and infrastructure.

## **Affected Environment**

### *Physiography*

Clear AFS is located in the Yukon Region of Interior Alaska on the southern margin of the Tanana-Kuskokwin Lowlands physiographic province, adjacent to the Northern Foothills province of the Alaska Range. The Lowlands can be characterized as a broad, relatively flat, sediment-filled depression formed by glacial meltwater outwash. The Nenana River floodplain flanks the western edge of Clear AFS. Clear AFS is covered with many interlaced channels, terraces, and banks. Local topographic relief of these features generally ranges between 0.5 to 2.0 meters (2 to 7 feet). Surface elevations are greatest at the southern Clear AFS boundary at approximately 198 meters (650 feet); however, the regional surface gradient is relatively mild at about 5 meters per kilometer (25 feet per mile) to the north.

### *Geology*

The mountain building and glacial history of the Alaska Range to the south have influenced the geology of Clear AFS. Glacial advances ceased abruptly at the present escarpment of the Northern Foothills of the Alaskan Range. The uplift of the Northern foothills, advance and retreat of the glaciers, and subsequent erosion by major drainages originating in the Alaska Range and foothills provided the source for major sedimentary deposition in the Tanana River Valley.

The sediments underlying Clear AFS are derived from several sources: alluvial fans developed upon the Nenana gravel pediment (a gently sloping bedrock with low-relief covered with gravel and sand) at the mountain front; Pleistocene glacial outwash (cobbles, sand, and silt debris); Holocene alluvial sediments (mostly silt and sand) from the Nenana River; wind transported silt (loess) reworked from channel bars onto terraces; and Modern colluvium from water reworked loess. The sedimentary wedge is primarily composed of sandy gravel, poorly stratified with well to poorly graded coarse sand. The thickness is estimated to exceed several hundred feet.

### *Soils*

Generally, soils at Clear AFS are predominately well drained sands and gravels overlaid with a thin layer of silt. These soils vary from 0.9 meter (3 feet) to 1.8 meters (6 feet) deep, and then a sandy gravel horizon varying from the 1.8-meter level (6 feet) to below 9 meters (30 feet) occurs below the layer of silty soils. Areas dominated by spruce are generally covered by a peat layer 0.3 meter (1 foot) thick over a silt horizon that varies from 0.9 to 1.5 meters (3 to 5 feet) in depth. Under this horizon are horizons of sand, silt, and gravel combinations.

Silty soils of the station are generally well drained, although the drainage may be impeded in some areas by intermittent pockets of permafrost. Areas covered by the peat are more susceptible to permafrost, and drainage is poor. Permafrost may extend below 8 meters (25 feet) in these areas. The occurrence of permafrost at Clear AFS is discontinuous and comparable to Fairbanks and other areas in the Tanana Valley. The permafrost is sporadic, and locations free of permafrost can be outlined by drilling. Soils at Clear AFS have low erodibility. Erosion is minimized by vegetation and low annual precipitation.

### **3.6.5 HAZARDOUS MATERIALS AND WASTE**

A general description of hazardous materials and waste is provided in the beginning of section 3.1.5.

#### **Region of Influence**

The ROI for hazardous materials and hazardous waste management includes the Clear AFS infrastructure and existing facilities. Additional facilities associated with the Proposed Action could be constructed within the boundaries of the base.

#### **Affected Environment**

##### *Hazardous Materials Management*

Hazardous materials are regularly used and stored throughout Clear AFS. The most commonly utilized hazardous materials include paints, paint thinners and removers, adhesives, solvents, sodium dichromate, hydrostatic fluids, batteries, pesticides, petroleum, oil, and lubricants. Hazardous materials are controlled and managed through a pharmacy program. Hazard Communication training is provided to all personnel whose jobs involve handling or managing hazardous materials. Material Safety Data Sheets for hazardous materials are maintained on file in the workplace, where they are used or stored, and in a central repository maintained on the Hazardous Material Information System.

There are 29 ASTs, ranging in size from 189 to 113,562 liters (50 to 30,000 gallons), at Clear AFS. They serve as storage tanks for petroleum for building heat and vehicle fueling. All USTs have been removed from Clear AFS.

Clear AFS has developed a Spill Prevention and Response Plan, which combines both a Spill Prevention Control and Countermeasures Plan that describes the procedure, methods, and equipment used to prevent spills, and an Oil and Hazardous Substances Pollution Contingency Plan that details procedures for releases, accidents, and spills involving these substances. The base also complies with reporting requirements by submitting annual emergency response and extremely hazardous substances updates to local emergency management officials.

##### *Hazardous Waste Management*

Clear AFS is a large quantity generator of hazardous waste and is allowed to accumulate waste for up to 90 days. Hazardous waste streams generated by operations at Clear AFS

include waste paint; waste paint with methyl ethyl ketone, lead and mercury; solvents; batteries; waste oil with lead, sulfide, cadmium, and chromium; and spill residuals. In 1997, Clear AFS generated 4,977 kilograms (10,973 pounds) of hazardous waste.

Clear AFS operates one central accumulation point for storage of hazardous waste located in the composite area at Building 250. Waste from the six satellite accumulation points is forwarded to the central accumulation point. Waste is then shipped to a permitted storage facility at Fort Wainwright, Alaska operated by the Defense Reutilization and Marketing Office and then shipped to a final permitted treatment, storage, and disposal facility.

Clear AFS has developed a Hazardous Waste Management Plan that includes designation of responsible personnel, hazardous waste identification and management practices, training requirements, hazardous waste storage, accumulation point managers, and turn-in procedures.

#### *Pollution Prevention*

Clear AFS' Pollution Prevention Management Plan aids in the elimination or reduction of hazardous substances, pollutants, and contaminants.

Clear AFS also administers a hazardous materials pharmacy program that tracks hazardous materials from the point at which they are brought onto the facility until they are brought back to the pharmacy, either as empty containers or as excess material. This pollution prevention initiative is designed to control and reduce the amount of hazardous materials at the installation.

Recycling capabilities in Alaska are very limited. Since 1992, an average of 22,525 liters (5,950 gallons) of waste oil, 665 kilograms (1,470 pounds) of asphalt, 2,655 kilograms (5,850 pounds) of rags, and 2,790 kilograms (6,150 pounds) of paper per year have been burned in the power plant.

#### *Installation Restoration Program*

IRP investigations at Clear AFS since 1991 have identified 23 sites of potential contamination. Of these sites, 22 are considered closed sites, pending the state's written approval. Clear AFS is not on the National Priorities List site and does not have a Federal Facility Agreement.

#### *Asbestos*

Clear AFS has developed an Asbestos Management Plan and an Asbestos Operations Plan that includes designated personnel responsible for asbestos management, descriptions of asbestos management activities, and discussions of record keeping procedures. The Asbestos Operations Plan establishes procedures for asbestos abatement and includes

budgeting concerns, planning procedures, notification requirements, health and safety equipment requirements, and an overview of a small-scale removal.

An asbestos survey was conducted on all facilities on Clear AFS in 1986. All facilities contain asbestos, except the main dormitory, which was remodeled. Prior to any building modifications, all asbestos in the affected area is removed in accordance with Federal Regulations. Asbestos-containing material wastes are disposed of in the Clear AFS landfill, which is permitted to accept asbestos.

Up to 0.3 square meter (3 square feet) of asbestos-containing material can be handled by the installations' contractor. Asbestos repair or removal of more than 0.3 square meter (3 square feet) of asbestos-containing material will be handled by other contractors specializing in asbestos abatement.

#### *Polychlorinated Biphenyls*

A site wide PCB inventory was conducted in 1990, and all known PCB and PCB-contaminated equipment has either been removed or purged and refilled with non-PCB fluid. Removal of suspected PCB-contaminated radio frequency interference filters is planned. As ballasts and small capacitors are replaced, they are stored in Building 252 for later disposal in accordance with applicable regulations.

#### *Lead-based Paint*

Most of the buildings on Clear AFS contain lead-based paint, except for dormitories 203 and 204, which have been remodeled. Prior to any building modification, all lead-based paint in the affected area is removed in accordance with Federal regulations. Clear AFS has a comprehensive lead-based paint management plan.

#### *Radon*

With guidance from the Bioenvironmental Engineer at Eielson AFB, Clear AFS has developed and administrated a radon assessment and mitigation program. Radon inspection surveys were performed for Clear AFS in 1995. Radon levels were found to be well below the current U.S. EPA guidelines of 4 picocuries per liter (Clear Air Station, 1995—Site Radon Inspection Report).

#### *Pesticides*

The use of pesticides at Clear AFS is only on an as-needed, seasonal basis. Applications are kept to a minimum, and are restricted to developed areas of the installation. When utilized, pesticides are pre-approved by the Federal Pesticides Working Group and applied by state-certified personnel. Aerial spraying is not conducted, and pesticides are not applied to any waters of the state.

### 3.6.6 HEALTH AND SAFETY

A general description of health and safety is provided at the beginning of section 3.1.6.

#### Region of Influence

The ROI for health and safety of workers includes the immediate work areas utilized during construction and operation of the Proposed Action facilities. The ROI for public safety includes properties immediately adjacent to the air station and the transportation network for hazardous materials.

#### Affected Environment

The Clear AFS fire department maintains one structural pumper, a smaller firefighting vehicle, and an emergency command vehicle. One centrally located facility houses the equipment. The positioning of this facility meets the U.S. Air Force time and distance requirements for facility response. The base contractor has a Health and Safety Plan and there is a full-time emergency medical technician on the base.

Base health and safety issues at Clear AFS include EMR associated with operation of the Ballistic Missile EWR and runway approach clearance zones at the end of the Clear Airport public airstrip. To ensure operational safety around the EWR, a 1,524-meter (5,000-foot) control zone is maintained for structures emanating in a northwesterly direction from the radar. Radiation exposure measurements taken in surveys identified areas in which the power density levels exceeded the permissible exposure level of 4 milliwatts per square centimeter. These areas are within the base Technical Site where the radar facilities are located. All areas in which radiation levels above the permissible exposure level were measured have been posted with warning signs, and access is strictly controlled during radar operation. The base also maintains a Radiation Protection Program, which is implemented by the Radiation Protection Officer. This program is intended to identify, monitor, and control areas and sources of potentially hazardous radiation, and to provide training for personnel working at the site with respect to such hazards.

A new solid state phased-array radar was installed at Clear AFS and became operational in early 2001 (Raytheon, 2001). The former mechanical radar was decommissioned. Ground-level measurements taken at a distance of 305 meters (1,000 feet) from similar radar as the new phased-array averaged 0.005 milliwatt per square centimeter, well below the permissible exposures for uncontrolled environments (areas where the general public has access) level for frequencies of 420 MHz of 0.29 milliwatts per square centimeter averaged over 30 minutes. In addition, the phased-array radar is not expected to be a threat to fuel-handling operations or to ground-based electroexplosive devices.

Clear Airport is a small public airstrip northeast of the base. The runway approach clearance zones on the southern end of the runway are on Clear AFS boundary. The airstrip is primarily used by small private planes and has no scheduled commercial service.

### 3.6.7 INFRASTRUCTURE

A general description of infrastructure elements is provided in the first paragraph of section 3.1.7.

#### **Region of Influence**

The utility systems that could potentially be affected by the Proposed Action include potable water pumping, treatment, storage, and distribution; wastewater collection and treatment; solid waste collection and disposal, and energy generation and distribution, including the provision of electricity and natural gas.

#### **Affected Environment**

##### *Water Supply*

**On-base.** Clear AFS obtains its potable water from wells with a total capacity of 55.2 million liters per day (14.6 million gallons per day), and average daily water consumption for industrial and domestic use was 35.5 million liters per day (9.37 million gallons per day) in fiscal year 1995. Chlorination is provided for the potable water.

Five wells in the Technical Site supply water for the power plant's turbine condenser cooling, demineralization, and plant cooling. These wells have a combined capacity of approximately 19 million liters per day (5 million gallons per day). Average daily consumption in 1995 was 11 million liters per day (3 million gallons per day). Industrial water is cycled through a 62.1-million-liter (16.4-million-gallon) cooling pond. Excess water is discharged to Lake Sansing. Two of the industrial wells at the power plant can also be used to supply potable water for domestic purposes.

Seven wells in the Technical Site supply water to the radar facilities for cooling and to heat exchangers that cool radar equipment located in buildings 101 and 102. These wells have a combined capacity of 24.2 million liters per day (6.38 million gallons per day).

Water for domestic purposes is supplied by three wells with a total capacity of 12.3 million liters per day (3.24 million gallons per day). Water consumption for domestic purposes averaged 0.64 million liters per day (0.17 million gallons per day) in 1995. Water used for human consumption, food preparation, and fire protection is chlorinated.

**Off-base.** Cities potentially impacted by activities at Clear AFS include Anderson, Cantwell, Ferry, Healy, Lignite, McKinley Park, and Nenana. In all of these cities except for Nenana, the majority of homes have individual wells, septic systems, and plumbing.

The Nenana water system is approximately 20 years old. It has two wells able to be used as potable water sources. The primary well is 61 meters (200 feet) deep and has a pumping capacity of 0.545 million liters per day (0.144 million gallons per day). The secondary well is 21 meters (70 feet) deep and is rarely used. The system has a storage capacity of approximately 1.6 million liters (0.42 million gallons), and average usage is approximately 0.136 million liters per day (0.036 million gallons per day).

Approximately 75 percent of the city is served by the current system, and a study is underway to upgrade the design to incorporate approximately 90 percent of the community. Those not on the city water system have their own private wells.

### *Wastewater*

**On-base.** Based on potable water pumping records from January 1996 to February 1997, the average daily domestic wastewater flow for Clear AFS is 0.87 million liters per day (0.23 million gallons per day). Sanitary sewage from all Camp facilities with water service (except Buildings 26 and 51 and the Composite Area) is conveyed by gravity flow to an Imhoff tank, which functions much like a septic tank. Sanitary sewage from the Composite Area is conveyed to the Imhoff tank via a lift station. The Imhoff tank is cleaned by moving accumulated sludge into a drying bed and then transferring the dried sludge to the base landfill. The effluent from the Imhoff tank drains into a leach field.

The new leach field that currently accepts the effluent from the Imhoff tank was designed using performance data from the previous two leach fields. The new leach field has an area of approximately 2.4 thousand square meters (26 thousand square feet) and is estimated to be able to accept the current load of 0.87 million liters per day (0.23 million gallons per day) for 10 to 20 years.

Sanitary sewage from the Technical Area flows into septic tanks with leaching wells or pits. Each of three Scanner buildings, the two Tracker buildings, and the power plant has its own septic tank and leaching well or pit.

Cooling water from the Clear AFS Power Plant is discharged to a ditch at a point 15 meters (50 feet) from where the ditch flow enters Lake Sansing. This discharge is covered by State of Alaska Wastewater Disposal Permit number 9531-DB004. The permit requires the discharge to be no more than 23 million liters per day (6.2 million gallons per day).

There are continued concerns regarding the unwanted goldfish (domestic fish released into the system) that reside in the power plant, cooling pond, discharge ditch, and Lake Sansing. Unless all goldfish are completely removed from the power plant system, the possibility remains for unauthorized release of these fish into waters of the Nenana River drainage

**Off-base.** Wastewater treatment for the city of Anderson homes without septic systems consists of a sewage lagoon. The system has a capacity of approximately 2.2 million liters per year (0.6 million gallons) with an average use of 1.5 million liters per year (0.4 million gallons). Wastewater treatment for the city of Nenana consists of a piped gravity system that collects the sewage and a secondary rotating biological contactor treatment plant. Approximately 75 percent of the city homes are connected to the sewer system, and a study is underway to determine an efficient method of connecting up to 90 percent of the community. No allowance is made for industrial waste treatment. The current system has a treatment capacity of approximately 0.23 million liters (0.06 million gallons) per day and is generally operated at or near capacity.

### *Solid Waste*

**On-base.** The annual solid waste production on Clear AFS is approximately 5,168 cubic meters (6,760 cubic yards) or about 1,533 metric tons (1,690 tons). The break down of the waste stream is 20 percent municipal waste, 16 percent construction waste, and 64 percent fly ash. The waste is collected from containers throughout Clear AFS and taken to the Denali Borough landfill. The previously used Clear AFS landfill has been closed.

**Off-base.** The Nenana landfill was closed in July 1998. Solid waste in Nenana and the area surrounding Clear AFS is collected by a private firm and delivered to the Denali Borough landfill.

### *Energy*

**Electricity—On-base.** Electricity is generated onsite at the Clear AFS Power Plant by three General Electric, Class A, 7.5-MW generators. Each turbine generator is powered by steam from three coal-fired boilers. The combined electrical generating capacity of the three generators is 22.5 MW. Average demand is 9 MW, for an annual consumption of 78.8 million kW-hours. An emergency General Motors, Class C, 1,400 horsepower, 1-MW diesel generator is also available. The Clear AFS electrical system is not connected to the public grid.

**Electricity—Off-base.** The Golden Valley Electric Association is a non-profit, member-owned cooperative that provides electrical service to the Fairbanks North Star Borough, the Denali Borough, unincorporated areas between these two boroughs, and along the Richardson Highway to Fort Greely. Clear AFS, Eielson AFB, Fort Wainwright, Fort Greely, Fort Knox Gold Mine, the University of Alaska Fairbanks, and the communities of Fairbanks, North Pole, Nenana, Delta Junction, and Healy are all located in Golden Valley Electric Association's service area. Golden Valley Electric Association provides electricity to approximately 90,000 people via over 36,000 service locations.

The Golden Valley Electric Association has a generating capability of 224 MW of power, with an additional 70 MW available through the existing Fairbanks/Anchorage intertie. In 1996, there was a peak demand of 134.1 MW and total energy sales of 653 million kilowatt-hours. In 1997 the peak demand was 163 MW.

## **3.6.8 LAND USE**

A general description of land use is provided in the first paragraph of section 3.1.8.

### **Region of Influence**

The ROI for land use includes the installation property and surrounding adjacent lands.

### **Affected Environment**

Clear AFS is located in Interior Alaska, in the northeast corner of the Denali Borough. The Denali Borough is the zoning and development authority in the region. However, almost

the entire zone is virtually zoned as "unrestricted use," which allows almost any type of development unless individual communities vote to have further zoning or land use regulations. Since Clear AFS is a Federal property, it does not fall under the jurisdiction of the local planning authorities. The area around Clear AFS is sparsely populated and consists of undisturbed forestland. The nearest inhabited structure is just to the south of the base, and the community of Anderson is 8 kilometers (5 miles) to the north. The city of Anderson operates a small airport on the adjacent property to the west. None of the land uses in the area are incompatible with adjoining land uses of Clear AFS.

#### *Clear AFS Land Use*

Clear AFS consists of 4,670 hectares (11,542 acres) with approximately 142 hectares (350 acres) of the installation developed and the remainder relatively undisturbed forested land. Of the total acreage at Clear AFS, 4,666 hectares (11,530 acres) are withdrawn from the public domain from the Department of the Interior, Bureau of Land Management, and 4.7 hectares (11.5 acres) are by easement from the State of Alaska.

The mission facilities of Clear AFS are divided into three main areas and are centrally located on the installation. The Composite Area contains the headquarters, housing, recreation, community service, and administrative facilities, and is just inside the main gate to the north. The Technical Site (also known as the Operations Area) is located to west of the Composite Area and contains the deactivated Ballistic Missile Early Warning System radar and related equipment as well as the power plant. Just north of the Technical Site is the site of the Solid State Phased-Array Radar that replaced the EWR. The third area is the Camp Area, which is located to the south of the Composite Area. This area is composed of civil engineering maintenance shops, security police offices, a fire station, and transient lodging. The remainder of the installation is open space consisting of mostly undisturbed forest that is at times used by military personnel for recreation activities and hunting.

Stationed personnel use the base for various recreational activities. Hunting and fishing are the most common activities. There are also hiking, cross-country skiing, running, picnicking, snowshoeing, snowmobiling, and off-road vehicle use. Use is limited to military personnel, and there is no subsistence hunting or fishing occurring on base.

### **3.6.9 NOISE**

A general description of noise is provided in the beginning of section 3.1.9.

#### **Region of Influence**

The ROI for noise includes those areas potentially affected by proposed activities that might experience DNLs greater than or equal to 65 dBA, those areas potentially affected by proposed activities that might experience short-term noise events (of less than 8 hours) with noise levels greater than or equal to 85 dBA, and those areas along roadways potentially affected by proposed activities that might experience a  $L_{eq}(1 \text{ hour})$  greater than or equal to 67 dBA.

## **Affected Environment**

The area surrounding Clear AFS is sparsely populated and is expected to have a background noise level of DNL less than or equal to 55 dBA. Furthermore, no major sources of noise are known to exist around the NMD site at Clear AFS, thus traffic is the main source of noise at Clear AFS and vicinity.

The main highway in the vicinity of Clear AFS is the George Parks Highway. The summer average daily traffic count for the George Parks Highway in the vicinity of Clear AFS is 2,011. Traffic noise levels of  $L_{eq}(1 \text{ hour})$  equals 72 dBA,  $L_{eq}(1 \text{ hour})$  equals 67 dBA, and  $L_{eq}(1 \text{ hour})$  equals 57 dBA are estimated to occur at approximately 14 meters (46 feet), 31 meters (101 feet), and 143 meters (469 feet) from the highway, respectively. For the purpose of analysis, the speed of the traffic was assumed to be 105 kilometers (65 miles) per hour.

No noise sensitive receptors (churches, schools, communities) are known to exist in the vicinity of the proposed sites at Clear AFS.

### **3.6.10 SOCIOECONOMICS**

A general description of socioeconomics is provided in the first paragraph of section 3.1.10.

#### **Region of Influence**

For the purposes of analysis, the economic ROI is considered to coincide mainly with the Denali Borough boundary, within which several small centers of population exist. These include Anderson, Cantwell, Ferry, Healy, Lignite, Nenana, and McKinley Park.

#### **Affected Environment**

Clear AFS is in the Denali Borough in Interior Alaska. It is within the city boundary of Anderson, 126 kilometers (78 miles) southwest of Fairbanks and 459 kilometers (285 miles) north of Anchorage. The AFS was founded in 1961 as a ballistic early warning site a year before Anderson was incorporated. Clear AFS is in a sparsely populated region that, until the late 1960s, had a rudimentary road network. Over 90 percent of the residents of Anderson are employed by Clear AFS or other Federal and state entities.

#### *Population*

Denali Borough was incorporated in 1990, with a population of 1,797. The 2000 U.S. Census population count for the borough shows an increase of 5.3 percent to 1,893 people. Alaska Natives comprised 8.6 percent of the population of Denali Borough in 2000. The population of Alaska grew by 14 percent during the same period. An increasing proportion of the borough's citizens live within the six communities listed above—88 percent in 1990, growing to 92 percent in 1997. Over two-thirds live in the cities of Anderson and Healy. While Healy grew by 513 people between 1990 and 2000, Anderson lost 261 residents. Nenana grew from a population of 393 in 1990 to 402 in 2000.

### *Employment*

Denali Borough had 759 jobs in 1990, almost half of which were at, or dependent on, Clear AFS. The other main employers in the borough are the Usibelli Coal Mine, Golden Valley Electric Association and the local School District. Tourism-related industry also accounts for a significant proportion of local jobs. Denali National Park provided virtually all McKinley Park's 84 jobs in 1990.

Highway tourism, based on the George Parks Highway that links Anchorage to Fairbanks, is important to communities such as Cantwell, Healy, and Lignite.

The Usibelli Coal Mine, located at Healy, employs 145 people and supplies over 800,000 tons of coal a year to the local power company, the University of Alaska and the military. In 1990, 127 people in Nenana's population were employed, with over one half occupying Federal, state, or local jobs. Other significant sources of employment included Yutana Barge Lines and various local tourist destinations. Unemployment in 1990 reached 17.5 percent.

The overall unemployment rate in Denali Borough was 10.1 percent in 1990, with 35.6 percent of the total population stating that they were economically inactive. These figures, however, masked extremes within the borough communities, where unemployment rates were as low as 3.9 percent in Healy and as high as 34.6 percent in Cantwell and 39.1 percent in Ferry. These extremes underline the statistical impact of very low regional population counts.

### *Retail Sales*

Retailing in Denali Borough is carried out on a very limited basis, providing for basic needs. According to the 1992 Census of Retail Trade, there were eight retailing establishments in the borough. In aggregate, they employed 20 people and had an annual turnover of about \$3.2 million. They included a food store, two gas stations, three restaurant/bars and two miscellaneous stores. Fairbanks is the nearest variety retailing center to the ROI.

Nenana has a small amount of retailing that in 1990 employed 20 people, suggesting that it matches Denali Borough with respect to this activity.

### *Income*

In 1990, Denali Borough had a median household income of \$47,884; exactly half the households had an income higher than this figure, while half had household incomes lower. Ten percent of the residents of Denali Borough were living below the poverty level in 1990. Nenana had a median income of \$27,292 and 10.4 percent of its population were below the poverty level in 1990.

### *Housing, Education, and Health*

Denali Borough had 1351 housing units, according to the 2000 Census. Of these, about 42 percent were vacant. Nenana had an additional 210 housing units in 2000, and about 19 percent were vacant.

There are three schools in Denali Borough and two in Nenana, with a total roll of about 2260 students. Denali Borough's schools are located in Anderson, Cantwell, and Healy.

Health care in Denali Borough and Nenana is provided at clinics or on an auxiliary basis by one or other of the emergency services. The nearest hospital to Denali Borough is in Fairbanks. There are clinics at Nenana, Anderson, Cantwell, and Healy. Clear AFS has a clinic that is restricted to Clear AFS personnel, unless emergency assistance is required.

### *Fiscal Conditions*

In 1999, Denali Borough raised almost \$2.06 million of operating revenues from various sources including taxes and external state funds. An important source of tax revenue was the 7 percent bed tax levied on temporary accommodation within the borough. About 52 percent of the operating revenue was applied to local education. The remaining 48 percent of revenues was split among government administration (13 percent), public safety (about 6 percent), public services (about 3 percent), and surplus funds (26 percent).

Nenana raised almost \$4.2 million in operating revenues in 1999, over 80 percent of which was obtained from state and Federal sources. Nenana does not levy a bed tax. About 73 percent of revenues was spent on local education services.

## **3.6.11 WATER RESOURCES**

A general description of water resources is provided in the beginning of section 3.1.11.

### **Region of Influence**

The water resources ROI includes all surface water features, drainage areas, and underlying aquifers that could be affected by construction or operations.

### **Affected Environment**

#### *Surface Water*

Clear AFS is located in the Nenana River watershed. Surface water flow on Clear AFS follows the topography in a northeasterly direction. Runoff follows several small creeks north of the station that flow into the Nenana River. Due to the low mean annual precipitation of 33 centimeters (13 inches) for the area, very little overland flow occurs other than at spring. The 100-year floodplain of the Nenana River is restricted to the westernmost portion of the installation.

Four primary bodies of water are contained on or border Clear AFS. The largest of these is the Nenana River, which runs along the entire west boundary of Clear AFS. The other water bodies, Lake Sansing, the power plant cooling ponds, and the radar cooling water reject ditch, are man-made. There are approximately 1.6 kilometers (1 mile) of relatively undisturbed wilderness between the Nenana River and any developed area on Clear AFS. Lake Sansing is a groundwater infiltration area (approximately 5 hectares [12 acres]) contained in an old gravel borrow pit, and is fed by the radar operations cooling pond overflow via the reject ditch and by rainfall. The cooling pond is an unlined reservoir (approximately 3 hectares [8 acres]) that receives water through an underground pipe from the power plant. There is no surface water within the areas proposed for use.

Clear AFS does not discharge storm water into any "waters of the United States," and is currently not required to have a NPDES Multi-Sector Industrial Storm Water Permit. However, Clear AFS has prepared a SWPPP to establish a system and guidelines to reduce or eliminate potential storm water pollution.

#### *Groundwater*

The groundwater within the ROI occurs in an unconfined aquifer composed of unconsolidated sand and gravel. Depth to water ranges from approximately 17 to 20 meters (55 to 65 feet) below the surface, and tends to flow north at a gradient of about 1 meter (3 feet) per mile. The groundwater receives its recharge from the infiltration from the Nenana River, surface water features, and precipitation. The groundwater discharges about 8 kilometers (5 miles) north of Clear AFS into Julius Creek and Clear Creek.

Water for domestic and industrial use at Clear AFS is obtained from 15 wells completed to depths of approximately 46 meters (150 feet).

#### *Water Quality*

Water quality is subject to seasonal variations, but which are within established EPA drinking water standards. There are several water supply wells down gradient from the onsite landfill that are checked for water quality on a regular basis. No contaminants were detected in monitoring wells installed around the site landfill during the previous monitoring of groundwater at the landfill.

### **3.6.12 ENVIRONMENTAL JUSTICE**

A general description of environmental justice is given in the beginning of section 3.1.12.

#### **Region of Influence**

The ROI for Clear AFS consists of the Denali Borough (formerly the Yukon-Koyukuk Census Area), Ferry, Healy, and Lignite CDP, and Anderson and Nenana City.

**Affected Environment**

This borough during the 1990 Census was the Yukon-Koyukuk Census Area. Since that time it has been divided and Clear AFS now falls into the Denali Borough. This document will refer to data from the 1990 Census and will refer to the ROI as the Yukon-Koyukuk Census Area. Based upon the 1990 Census of Population and Housing, the Yukon-Koyukuk Census Area had a population of 8,478. Of that total, 2,208 persons, or 26.05 percent, were low-income, and 4,957 persons, or 58.47 percent, were minority. This borough covers a wide area.

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## **4.0**

# **ENVIRONMENTAL CONSEQUENCES**

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## 4.0 ENVIRONMENTAL CONSEQUENCES

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To assess the potential for and significance of environmental impacts from the proposed program, a list of activities was developed (section 2.0) and the environmental setting was described, with emphasis on any special environmental sensitivities (section 3.0). Program activities were then compared with the potentially affected environmental components to determine the environmental impacts of the proposed GBI VOC test site activities.

This section describes the potential environmental consequences of the proposed activities by comparing them with the potentially affected environmental components. Sections 4.1 through 4.6 provide discussions of the potential environmental consequences of these activities. Potential impacts are discussed in terms of construction, operation, and cumulative impacts. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.7 through 4.15 provide discussions of the following with regard to proposed GBI VOC test site activities: cumulative impacts; environmental effects of the No-action Alternative; adverse environmental effects that cannot be avoided; conflicts with Federal, state, and local land use plans, policies, and controls for the area concerned; energy requirements and conservation potential; irreversible or irretrievable commitment of resources; relationship between short-term use of the human environment and the maintenance and enhancement of long-term productivity; natural or depletable resource requirements and conservation potential; and Federal Actions to Protection of Children from Environmental Health Risks and Safety Risks (Executive Order 13045).

### 4.1 FORT GREELY, ALASKA

As discussed in chapter 2, the Preferred Alternative is to establish the GBI VOC test site at Fort Greely. Proposed activities at Fort Greely include:

- Construction and operation of six GBI silos and corresponding support facilities such as an Interceptor Storage Facility, mancamps, and the Readiness and Control Station
- Repair and interior modification of existing facilities to house managers and test facility operators
- Installation and Operation of an Execution Level BMC2 Node
- Construction and operation of one IDT
- Construction and operation of BMC3 facilities required to support test activities including one DSCS earth terminal with one antenna
- Installation of FOC
- Electricity distribution upgrades
- Solid waste landfill extension, construction debris disposal, and landfill access road
- Repairs to the Allen Army Airfield runway

These activities are analyzed below by applicable resource. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. The GBI silos and support facilities are grouped together as "GBI" for analysis, except for the on post mancamps. Given the retention of previously surplus facilities on Fort Greely, it may not be necessary to construct mancamps. Therefore, the potential impact of constructing and operating onpost mancamps has been separately analyzed to assist the decision maker in determining whether to provide the temporary facilities. The BMC2 node, IDT and DSCS are grouped together as "BMC3" for analysis. Initial analysis indicated that the Proposed Action would not result in short-or long-term impacts to airspace. Under the Proposed Action, there are no requirements for any restricted airspace as a result of the Proposed Action; therefore, there would be no impact to this resource area and it is not analyzed further.

#### **4.1.1 AIR QUALITY**

This section addresses potential environmental impacts caused by changes to the air quality environment due to the proposed construction and operation of the GBI VOC test site. Impacts considered include potential effects from ongoing or planned activities at these sites. Potential impacts were determined using the following criteria:

- Operations within attainment areas that could cause a detrimental change in attainment status of the area
- Operations within non-attainment areas that could impede or delay attainment of the NAAQS or state standards
- Increase in ambient air pollutants concentrations that could increase exceedances of the NAAQS or state standards
- Increases in air pollutant concentrations greater than 1 microgram per cubic meter (averaged over 24 hours) from new or modified major stationary sources within 10 kilometers (6 miles) of a Class I area

#### **Construction**

##### *GBI and BMC3*

If Fort Greely were selected as the site of the Proposed Action, most activities would occur south of the main base cantonment area. Although it is estimated that the proposed GBI, IDT, and DSCS facilities could require up to 162 hectares (400 acres), this also includes ESQD areas that would not result in ground disturbance. This total also includes approximately 54 hectares (134 acres) of land at Fort Greely that was previously disturbed during initial site preparation activities in 2001.

The proposed construction would cause temporary localized increases in air emissions. Emissions associated with construction activities include fugitive dust from ground disturbance, combustion byproducts from construction equipment and vehicles, and emissions from solvents and architectural coatings.

Ground disturbance would generate dust (PM-10) in the immediate vicinity of the construction. The levels of dust generated would change through time depending on the

level of activity, the weather, and the condition of the ground. It is expected that the majority of grading would be accomplished during the first 12 months of construction and that the majority of heavy equipment activities and overall ground disturbance would occur during the first 2 years.

Base-wide PM-10 emissions prior to realignment totaled 320 metric tons (353 tons). According to calculations performed for the NMD Deployment EIS based on clearing 243 hectares (600 acres), approximately 983 metric tons (1,084 tons) of PM-10 would be generated during 2 years of construction. Clearing anticipated for the Proposed Action would fall within this parameter.

Although the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceases, air quality would return to its former levels. Construction would be conducted in accordance with applicable regulations and permit requirements. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state standards beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

Increases in mobile emissions could also cause increases in ambient levels of some pollutants. Pollutants from mobile sources would include hydrocarbons, carbon monoxide, nitrogen oxides, and particle emissions. The primary pollutant of concern from mobile sources in Alaska is carbon monoxide. As such, this is the only pollutant from mobile sources analyzed in the NMD Deployment EIS and this study. Up to 80 percent of carbon monoxide emissions contributing to exceedances of the NAAQS in Fairbanks have been attributed to mobile sources. Cold starts during moderately cold weather, prolonged idling periods, and low-level temperature inversions all contribute to pronounced air quality impacts from motor vehicle emissions in cold climates.

For analytical purposes, it was assumed in the EIS that all personnel would commute individually an average of 40 kilometers (25 miles) one way to and from work at an average speed of 56 kilometers per hour (35 miles per hour). These assumptions are conservative and result in higher emission estimates than would actually be expected. Under these conditions each person would cause the emission of up to 430 kilograms (948 pounds) of carbon monoxide per year. Construction and use of the proposed administrative mancamp and/or use of existing facilities for temporary housing on Fort Greely would result in fewer vehicle trips and consequently substantially lower carbon monoxide emissions. Base emission inventory operations emissions do not include traffic emissions. However, there are allowances for anticipated traffic increases in the area's transportation budget. As such, project-related traffic is not expected to impact air quality.

The implementation of standard dust suppression techniques and a vehicle maintenance program would minimize fugitive dust emissions and vehicle exhaust emissions and would help to maintain the area's current high air quality.

#### *Electricity Distribution Upgrades*

A new power transmission line from the Jarvis Creek substation to the Fort Greely test site would require placing 24-meter- (80-foot-) high metal or wood poles that would support three transmission lines along the east or west side of the Richardson Highway. Air emissions for all three potential alternatives would be associated with trenching equipment

and pole emplacement, which would be short-term. Measures such as limiting vehicle trips along the right-of-way and keeping construction equipment onsite rather than driving it out on a daily basis (Bureau of Land Management, 1998) would help to reduce the potential for emissions.

#### *Mancamp*

The preferred location of the administrative mancamp is a 14.5-hectare (36-acre) area east of the existing housing area as shown in figure 2-12. However, only a small portion of the site would be cleared, leveled, and graveled. Construction impacts would be similar to those discussed above, on a smaller scale. Impacts would be basically the same for all alternative locations on Fort Greely, although use of Site 3 would require additional construction of access roads.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

No modifications to the Fort Greely burn pit would be required. An alternative for solid waste disposal is to construct a new construction debris landfill and access road in the vicinity of the existing landfill at Fort Greely. Another alternative for disposal of debris and other solid waste would involve placing inert construction debris on top of existing closed cells at the Fort Greely landfill or establishing a sixth cell in the current landfill site. Solid waste could also be transported to the North Star Landfill in Fairbanks.

ADEC solid waste regulations promote cost-effective, environmentally sound solid waste management and ensure that landfills are designed, built, and operated to minimize health and safety threats, pollution, and nuisances.

Disposal of solid waste from the GMD VOC activities would be in accordance with 18 AAC 50 Alaska Air Quality Control regulations, which outline requirements for permits needed to ensure compliance with ambient air quality standards. Adherence to these regulations would minimize the potential for impacts to air quality on Fort Greely.

#### *Allen Army Airfield Repair*

Repairing the airfield would include rebuilding a 335-meter (1,100-foot) section of the runway subgrade and repaving the rest of the runway with a 10-centimeter (4-inch) overlay of new asphalt. Although the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ends, air quality would return to its former levels. Construction would be conducted in accordance with applicable regulations and permits. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state standards beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

#### **Operations**

Potential operational air quality impacts could occur from the use of new or upgraded boilers and power generators, as well as emergency power supplies, vehicular emissions, and normal maintenance-related activities. Fort Greely is currently classified as a major source under the Prevention of Significant Deterioration (PSD) regulations. GMD Joint Program Office, U.S. Army Space and Missile Defense Command, and U.S. Army Alaska intend to apply for minor source reclassification by accepting facility-wide restrictions such

that emissions (with controls and proposed operating restrictions) will be maintained under the 227 metric tons per year (250 tons per year) emission limits for all PSD-regulated pollutants. Fort Greely contains a number of air emission sources, including an existing power plant with a total nominal capacity of approximately 5 MW and a number of smaller sources. Diesel Grade Arctic Fuel is the primary fuel for the existing Fort Greely sources and the GMD VOC test site.

Offsite power sources are planned for use at most proposed locations, with emergency generators supplying backup power. All emission sources at Fort Greely (including GMD VOC emission sources) would be operated under a facility-wide restriction (Synthetic Minor Permit) to maintain the emission of regulated pollutants under the 227 metric tons per year (250 tons per year) PSD threshold.

Normal maintenance activities would result in the emission of relatively minor levels of pollutants, consisting primarily of particulate and volatile organic compound emissions. None of the potential sites have high ambient levels of either of these pollutants. As such, the small amounts of solvents, cleaners, paints, and grit involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as a Title V Air Permit. MDA would apply for a separate Title V permit, if required.

#### *GBI and BMC3*

The current proposal would require the installation of generators ranging in output from 30 to 1,650 kW at the GBI site. Each generator or boiler would have a dedicated AST ranging in capacity from approximately 1,890 to 34,065 liters (500 to 9,000 gallons). The GMD VOC test site at Fort Greely may also include the installation of two 113,500-liter (30,000-gallon) bulk fuel storage tanks. It is assumed the generators would each be operated up to 250 hours per year (Boeing, 2001). All areas under consideration are in attainment areas and as such no General Conformity Applicability Analysis requirements are anticipated under the Proposed Action. The GMD Joint Program Office will conduct an air quality analysis of the GMD VOC test site facilities proposed at Fort Greely.

Standard day-to-day operations at the MAB or the EKV Assembly and Checkout Facility would add incrementally to the current emission levels. The average number of personnel at the site would be approximately 12 to 15, resulting in a slight potential increase in mobile source emissions. Normal maintenance activities would result in the emission of relatively minor levels of pollutants, consisting primarily of particulate and volatile organic compound emissions. None of the potential sites have high ambient levels of either of these pollutants. As such, the small amounts of solvents, cleaners, paints, and grit involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as a site's Title V Air Permit.

The IDT would be powered by an offsite commercial source with a backup 250- to 300-kW emergency generator operated for maintenance cycling and emergency power conditions in accordance with applicable permits. The generator would be fueled through

an AST with a capacity of approximately 3,785 liters (1,000 gallons), also used under applicable permits. The backup generator would be operated for up to 250 hours per year. (Boeing, 2001) The Fort Greely DSCS terminal would operate a series of 16 30 kW microturbine generators with one 34,068-liter (9,000-gallon) AST and one 2,460-liter (650-gallon) day tank to provide emergency or backup power and heat 24 hours per day. No impact to air quality is anticipated from these minimal releases. No adverse impacts to air quality are anticipated from operation of the IDT or DSCS terminal. Impacts to Fort Greely air quality would be the same at all proposed IDT and DSCS terminal location alternatives.

#### *Electricity Distribution Upgrades*

Maintenance of the upgraded electricity distribution system is not expected to result in impacts to air quality.

#### *Mancamp*

The administrative mancamp would provide office space for approximately 120 personnel and living and dining facilities for 200 personnel. As discussed above, the small amounts of materials involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as a site's Title V Air Permit.

Use of the proposed mancamp on Fort Greely would lower the number of vehicle trips and consequently would result in carbon monoxide emissions substantially lower than those indicated in the NMD Deployment EIS.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

Operation of the landfill extension or the new landfill, placing inert construction debris such as concrete rubble on top of the existing closed cells, or transporting debris and solid waste to North Star Landfill would all be in accordance with applicable Federal, state, and local regulations governing landfills, and no air quality impacts are anticipated. Continued use of the existing Fort Greely burn pit to dispose of burnable waste such as paper product and wood would not be expected to generate significant air emissions.

#### *Allen Army Airfield Repair*

Repair of the Allen Army Airfield would result in additional air traffic in and out of Fort Greely. This increased air traffic is not expected to exceed the NAAQS or state standards. The airfield is currently used for existing missions and emergency civilian use. No substantial adverse impacts to air quality in the region as a result of past and current airfield operations have been identified.

#### **Cumulative Impacts**

One program has been identified that could have a cumulative impact with implementation of the Proposed Action at Fort Greely. This program is the construction of new power lines from the Richardson Highway to the Alascom Microwave site. Emissions from mobile

sources would add cumulatively to emissions from other traffic sources in the area, but these emissions would be temporary and are not anticipated to result in a measurable impact on air quality within the ROI. The implementation of standard dust suppression techniques would minimize the potential for cumulative impacts from fugitive dust. The installation of the power lines would have relatively little impact on air quality and is not a potential source of cumulative impacts. In addition, as noted above, construction and operation of the GBI VOC test site components combined with ongoing base activities would not result in long-term cumulative air quality impacts.

#### **4.1.2 BIOLOGICAL RESOURCES**

This section addresses potential impacts to biological resources including vegetation, wildlife, threatened and endangered species, and environmentally sensitive habitat due to the proposed construction and operation of the GBI VOC test site on Fort Greely. Ground disturbance, habitat loss, noise from construction, and an increase in personnel during construction and operation of a GBI VOC test site at Fort Greely could result in impacts to biological resources present in the area.

##### **Construction**

###### *GBI and BMC3*

**Vegetation.** The GBI field and BMC3 sub-components would be constructed mainly in areas that have been disturbed by past and present training missions and areas that were cleared in 2001. Most of the vegetation at the proposed sites was burned in a 1999 wildfire. The GBI field and BMC3 sub-components would be sited in areas that were once composed of mixed forest and deciduous/high brush, which represents a small percentage of the total vegetation on Fort Greely. The areas where roads would be upgraded or constructed and FOC laid are also composed of mixed forest and deciduous high brush. No sensitive vegetation species have been identified within the proposed project areas.

**Wildlife.** There are no designated anadromous streams near the proposed GBI and BMC3 sites that would be impacted. Given the flat terrain and little rainfall in the region, runoff would not disturb any local water bodies. Although there are currently no plans that would affect inland anadromous fish, the National Marine Fisheries Service recommends that cables crossing anadromous streams be directionally bored, with no surface disturbance within 30 meters (100 feet) of ordinary high water on each side of the stream (National Marine Fisheries Service, 1999).

Construction ground disturbance and equipment noise-related impacts could include loss of habitat, displacement of wildlife, increased stress, and disruption of daily/seasonal behavior. Noise rather than the sight of machines appears to cause disturbance to wildlife. Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, additional similar habitat is adjacent to the area proposed for the GBI VOC test site location. Flushing would slightly increase individual energy expenditure. Some wildlife may leave the area permanently, while others may likely

become accustomed to the increased noise and human presence. The presence of personnel may cause wildlife to avoid the area, at least temporarily, but would therefore potentially reduce the potential for impacts from elevated noise levels. Wildlife in the immediate area (moose, bison, caribou, lynx, and migrating and resident birds such as the olive-sided flycatcher, northern goshawk, and harlequin duck) could be startled by construction noise and possibly avoid or leave the area during construction. Unique or sensitive wildlife habitat associated with the Delta River is located approximately 6 kilometers (4 miles) to the west of the area proposed for use by the program. The disturbance is not expected to alter migration patterns or wildlife corridors.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely. Protected bird species and the peregrine falcon, which was recently delisted but will continue to be monitored, migrate through the area during the spring and fall migration periods, and therefore could potentially be disturbed by construction-related noise. However, there have been no confirmed sightings within 16 kilometers (10 miles) of Fort Greely.

**Environmentally Sensitive Habitat.** Wetlands can be impacted both directly and indirectly. Direct impacts can result from filling, dredging, or flooding. Indirect impacts can be caused by disturbance to adjacent land that results in degradation of water quality from chemical or sedimentary runoff. Construction of the GBI VOC test site is not likely to directly impact wetlands. Indirect disturbance to wetlands would be further minimized by implementing appropriate techniques to control runoff and other BMPs such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff from construction sites, which would minimize water quality impacts to wetlands that could occur adjacent to the site. Selection of IDT Site 1, the preferred site, would have a lower potential to result in indirect impacts to adjacent wetlands than would selection of IDT Sites 2 or 3, which are closer to identified wetlands.

#### *Electricity Distribution Upgrades*

Golden Valley Electric Association has used several measures to minimize the potential for environmental impacts at similar construction projects in the area. These measures, which are discussed below, would also be implemented as applicable along the selected route.

**Vegetation.** Rights-of-way along existing roads and trails would be used where possible for construction of the transmission line. Clearing streamside vegetation would only be done to the extent necessary to allow access and provide clearance for transmission lines. Selected birch and cedar trees about 6 to 9 meters [20 to 30 feet] tall would be removed when necessary. (Bureau of Land Management, 1998) No sensitive vegetation species have been identified within the proposed project area.

**Wildlife.** No designated anadromous streams would be impacted. As discussed above, ground disturbance and equipment noise-related impacts could include loss of habitat, displacement of wildlife, increased stress, and disruption of daily/seasonal behavior. The combination of increased noise levels and human activity would likely temporarily displace some small mammals and birds that forage, feed, nest, or have dens within a 15-meter

(50-foot) radius of construction noise sources. However, additional similar habitat is adjacent to the proposed transmission routes. The disturbance is not expected to alter migration patterns or wildlife corridors.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely, and there have been no confirmed sightings of protected bird species within 16 kilometers (10 miles) of Fort Greely. No adverse impacts to threatened and endangered species are anticipated.

**Environmentally Sensitive Habitat.** Except for small areas at pole locations where pilings would be driven, soil would not be disturbed and thus construction would not likely adversely impact wetland functions. Clearing streamside vegetation would only be done to the extent necessary to allow access. Clearing in these areas would be done by hand where possible. Poles would be placed to avoid sensitive habitat as much as possible. (Bureau of Land Management, 1998) Implementing appropriate techniques discussed above would minimize disturbance to wetlands for all three potential alternatives. Activities would comply with any required wetlands permit guidance.

#### *Mancamp*

**Vegetation.** Ground disturbance during construction of the administrative mancamp would result in removal of vegetation within the proposed site. The proposed mancamp locations are all in areas partially composed of mixed forest and deciduous/high brush. No sensitive vegetation species have been identified within the proposed project areas.

**Wildlife.** The cantonment area at Fort Greely does not provide quality wildlife habitat compared to the surrounding undeveloped areas. Resident wildlife is limited to small rodents, bats, and a variety of songbirds. Impacts to wildlife in the area would be the same as those discussed above. The disturbance is not expected to alter migration patterns or wildlife corridors.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely.

**Environmentally Sensitive Habitat.** Construction of the administrative mancamp is not likely to directly impact wetlands. Implementing appropriate techniques discussed above would minimize disturbance to wetlands. Activities would comply with any required wetlands permits.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

**Vegetation.** Extension of the landfill and disposal of construction debris would take place in an area already sited and in use as a landfill. Constructing new cells south of the landfill could impact vegetation; however, no sensitive plant species have been identified on Fort Greely. No additional impacts to vegetation are anticipated.

**Wildlife.** Activities associated with extension of the existing landfill, construction of a new landfill, and disposal of inert construction debris would take place in an area already sited and in use as a landfill or immediately adjacent to the area. No additional impacts to wildlife are anticipated.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely.

**Environmentally Sensitive Habitat.** Activities associated with extension of the landfill and disposal of construction debris are not likely to directly impact wetlands. Implementing appropriate techniques discussed above would minimize disturbance to wetlands. Activities would comply with any required wetlands permits.

#### *Allen Army Airfield Repair*

**Vegetation.** The proposed repair of the Allen Army Airfield would take place in an area previously disturbed during original construction. Vegetation would continue to be maintained by mowing, and no additional impacts to vegetation are anticipated.

**Wildlife.** The proposed repair of the Allen Army Airfield would take place in an area previously disturbed during original construction and still used as an airfield. No additional impacts to wildlife are anticipated.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely.

**Environmentally Sensitive Species.** No impacts to wetlands are expected.

#### **Operations**

##### *GBI and BMC3*

**Vegetation.** No impacts to vegetation are anticipated during operation of the GBI VOC test site and BMC3 sub-components.

**Wildlife.** During operation, the GBI field would be dormant except for occasional building maintenance activities (painting, building repair, landscaping). Only minor, short-term impacts to wildlife, such as startling, are anticipated as a result of these activities. Security lighting could potentially attract wildlife to the project areas; however, any impacts would be minimal.

During normal operations the IDT would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated from operations.

Most operational impacts to wildlife from the IDT and DSCS terminal would come from security lighting and noise from the electrical generators required for the site. The lighting

and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise levels expected at the site could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities for backup generators or continuously if no commercial power is available to the site.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Fort Greely. Protected bird species and the recently delisted peregrine falcon migrate through the area during the spring and fall migration periods; however, there have been no confirmed sightings within 16 kilometers (10 miles) of Fort Greely.

**Environmentally Sensitive Habitat.** No impacts to sensitive habitat are anticipated during operation of the GBI VOC test site and BMC3 sub-components.

#### *Electricity Distribution Upgrades*

Operation of the upgraded electricity distribution system would not result in additional impacts to biological resources other than a slight increase in the potential for bird collisions with the new transmission poles and lines.

#### *Mancamp*

**Vegetation.** No impacts to vegetation are anticipated during operation of the administrative mancamp.

**Wildlife.** Only minor, short-term impacts to wildlife, such as startling, are anticipated due to the presence of personnel at the mancamp. Security lighting could potentially attract wildlife to the area; however, any impacts would be minimal.

**Threatened and Endangered Species.** As stated above, no threatened or endangered species have been identified at Fort Greely.

**Environmentally Sensitive Habitat.** No impacts to sensitive habitat are anticipated during operation of the mancamp.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

Operation of the landfill extension or the new landfill, placing inert construction debris such as concrete rubble on top of the existing closed cells, transporting debris and solid waste to the North Star Landfill, or use of the burn pit to dispose of burnable waste such as paper product and wood would all be in accordance with applicable Federal, state, and local regulations governing landfills and no impacts to biological resources are anticipated.

### *Allen Army Airfield Repair*

Applicable measures that were in place on Fort Greely to protect wildlife near the Allen Army Airfield, such as habitat management plans, ongoing raptor habitat surveys, and a Bird Air Strike Hazard Program would be reactivated. The Allen Army Airfield Airport Master Plan (City of Delta Junction, 2000) considered the NMD program as part of the High Forecast Scenario. This Scenario included delivery of up to 100 GBIs and an additional 4 to 5 flights per year for missile maintenance. According to the plan, none of the scenarios considered, including the High Action Scenario, appear likely to significantly impact wildlife or wildlife habitat. (City of Delta Junction, 2000) No substantial adverse impacts to biological resources in the region as a result of past and current airfield operations have been identified.

### **Cumulative Impacts**

Impacts would include increased activity during construction and the loss of a small amount of habitat at the proposed site. Given the small amount of loss of wildlife habitat in the region of Fort Greely from past and current development, the additional loss of habitat from the proposed GBI VOC test site would not result in a substantial cumulative reduction in habitat. Cumulative effects from other proposed activities were considered minimal in the EA to Construct Munitions Storage Facility Cold Regions Test Center, Bolio Lake (U.S. Department of the Army, 1997) due to the small size of the projects when compared to the vast amount of undeveloped land in the area.

### **4.1.3 CULTURAL RESOURCES**

This section addresses the potential for impacts to cultural resources due to construction and operation of the GBI VOC test site at Fort Greely.

Potential impacts on historic properties occur through:

- Disturbance of a National Register-listed, potentially eligible, or eligible prehistoric or historic archaeological site or traditional cultural property
- Modification of or visual intrusion upon a National Register-listed, potentially eligible, or eligible historic buildings or structures
- Disturbance of a paleontological site

### **Construction**

#### *GBI and BMC3*

**Prehistoric and Historic Archaeological Resources.** Archaeological surveys indicate that there are no known prehistoric or historic archaeological resources within the ROI. The area is heavily disturbed from previous clearing and operational activities, and the likelihood of historic properties being present is low.

Based on a 1997 survey, the entire cantonment, including the area around the runway, was considered clear of cultural resource concerns due to the lack of subsurface artifacts.

### *Historic Buildings and Structures*

Review of the 1998 study by the Alaska SHPO and subsequent consultation between the U.S. Army and the SHPO indicate that there are 26 buildings and structures eligible for listing in the National Register. Of these 26 historic properties, three (buildings 605, 656, and 675) may require modification for the GBI VOC test site program for use as warehouse and equipment maintenance space.

A Memorandum of Agreement between the U.S. Army and the Alaska SHPO regarding the 26 historic buildings stipulated that all of the properties "may be altered, demolished, leased with no restrictions, or transferred out of federal ownership with no restrictions" following completion of HABS Level 1 recordation. The SHPO accepted the U.S. Army's submission of products as meeting the minimum requirements of the Memorandum of Agreement on 15 May 2000.

Prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of GBI VOC test site program activities, cultural items are inadvertently discovered, activities would cease in the immediate area and the SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow guidance provided.

### *Native Populations/Traditional Resources*

No traditional cultural properties have been identified within the ROI or Alaska Native issues identified for the Proposed Action.

### *Paleontological Resources*

Paleontological remains have been recorded within the Fort Greely area; however, none have been identified within the ROI. Given the topography of the site and the types of locations within which paleontological resources typically occur, the likelihood for them to be encountered during the course of proposed activities is very low. Therefore, no effects are expected.

### *Electricity Distribution Upgrades*

Placing poles along the east or west side of Richardson Highway has the potential to disturb cultural resources. No cultural resources concerns have as yet been identified for any of the alternative routes. However, if during the course of the proposed activities, cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

### *Mancamp*

The proposed administrative mancamp would be constructed within an area adjacent to the cantonment area. The alternative locations were selected to minimize potential impacts to cultural resources. Due to the lack of subsurface artifacts, the entire cantonment has been

cleared of cultural resource concerns. No impacts to cultural resources are anticipated. However, if during the course of mancamp construction cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

Proposed GBI VOC test site activities associated with extension of the landfill and disposal of construction debris would take place in an area already sited and in use as a landfill, and potentially the adjacent area to the south. No impacts to cultural resources are anticipated. However, if during the course of mancamp construction cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

#### *Allen Army Airfield Repair*

The proposed repair of the Allen Army Airfield would take place in an area previously disturbed during original construction. Due to the lack of subsurface artifacts, the entire cantonment area, including the area around the runway, has been cleared of cultural resource concerns. No impacts to cultural resources are anticipated. However, if during the course of mancamp construction cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

### **Operations**

Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. No impacts to cultural resources are anticipated during operation of the GBI VOC test site at Fort Greely. However, if during operation at any GMD VOC component cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

### **Cumulative Impacts**

Future projects have been identified for Fort Greely that involves construction of new facilities or infrastructure. In addition, there is the potential reuse of base facilities in the cantonment area. None of these projects would occur in the vicinity of the GBI VOC test site ROI; therefore, no cumulative impacts are expected.

#### 4.1.4 GEOLOGY AND SOILS

This section addresses the potential impacts to geology and soils at Fort Greely due to the construction and operation of the GBI VOC test site.

##### **Construction**

###### *GBI and BMC3*

It is estimated that the proposed GBI, IDT, and DSCS facilities could require up to 162 hectares (400 acres) which is less area than was analyzed for the NMD Deployment EIS (243 hectares [600 acres]). The NMD Deployment EIS determined that there was no significant impact to geology and soils around Fort Greely resulting from similar proposed activities. In 2001, initial site preparation activities were completed, which disturbed 54 hectares (134 acres).

Construction of a new GBI field, IDT, DSCS terminal, access roads, and support facilities (including a possible administrative mancamp) would require additional grubbing and grading for site preparation beyond that which was already cleared in 2001. The main issue during construction is associated with soil erosion from the site. However, at Fort Greely the soils are predominately well drained sands and gravels overlaid with a thin layer of silt, surface relief is relatively flat, and the area receives minimal annual precipitation (33 centimeters [13 inches]) and light winds; therefore, minimal soil erosion to adjacent areas would be expected. BMPs would be used to reduce the potential for soil erosion. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes to enhance long-term stability. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Geotechnical studies conducted at the potential GBI site in 1999 did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

The potential GBI VOC test site is near historic sources of sand and gravel and placer gold along Jarvis Creek. Assuming the lands remain closed to mineral location, leasing, and sales, there would be no impact on the mineral resource except for local extraction to support construction; however, this should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract.

Construction of GBI VOC test site facilities would incorporate seismic design parameters consistent with the critical nature of the facility and its geologic setting. Facility construction would incorporate earthquake-resistant designs to reduce the potential of impacts occurring from a seismic event, including surface rupture.

###### *Electricity Distribution Upgrades*

Impacts to geology and soils along all three potential routes would be associated with disturbance to soils during trenching and pole emplacement, which would be short-term.

BMPs would be used to reduce the potential for soil erosion as applicable such as limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to slopes to enhance long-term stability. Geotechnical studies conducted in the vicinity did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

#### *Mancamps*

The preferred location for construction of the mancamp is a 14.5-hectare (36-acre) area east of the existing housing area as shown in figure 2-12. However, only a small portion of the selected site would be cleared, leveled, and graveled. Construction impacts would be similar to those discussed above for the GBI and BMC3 sub-components, on a smaller scale. Impacts would be basically the same for all alternative locations, although use of Site 3 would require construction of access roads. Geotechnical studies conducted in the vicinity did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

Establishing a sixth cell at the existing landfill or the creation of a new construction debris landfill and access road in the vicinity of the existing landfill could potentially result in impacts to soils; however, these would be short-term and localized. BMPs would be used to reduce the potential for soil erosion. Geotechnical studies conducted in the vicinity did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

#### *Allen Army Airfield Repair*

Repair of the airfield would involve excavating approximately 1 meter (3 feet) down from the top of the runway and rebuilding the section with 102 centimeters (40 inches) of compacted sub-base, a 15-centimeter (6-inch) drainage layer, 10 centimeters (4 inches) of new asphalt, and upgrades to the stormwater collection system. BMPs would be used to reduce the potential for soil erosion. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes. Geotechnical studies conducted in the vicinity did not discover any ice lenses or other permafrost features; therefore, no impacts to permafrost would be expected.

### **Operations**

Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the GBI VOC test site and no impacts to geology and soils are anticipated.

### **Cumulative Impacts**

No cumulative impacts are anticipated as a result of current ongoing training range activities, planned reuse of the Fort Greely cantonment area, or the construction of a new power line from the Richardson Highway to the Alascom Microwave Site in conjunction with construction and operation of the GBI VOC test site. Construction would include measures to reduce soil erosion on the site and to limit the extent of the erosion. Potential

reuse of the cantonment area would not result in significant new construction or ground-disturbing activities and, therefore, should not result in cumulative impacts. Once site vegetation is restored, no long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts to geology and soils in the area are expected from construction and operation at Fort Greely.

#### **4.1.5 HAZARDOUS MATERIALS AND WASTE**

This section addresses potential environmental impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with construction and operation of the proposed GBI VOC test site on Fort Greely. It also addresses potential impacts to ongoing IRP activities.

##### **Construction**

###### *Hazardous Materials Management*

Construction activities would be centralized to the greatest extent possible and would occur at the selected project site just south of the main base cantonment and on specified construction laydown areas and access roads. Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans. Fort Greely's Oil Discharge Prevention and Contingency Plan and SWPPP would also be updated.

###### *Hazardous Waste Management*

Hazardous wastes generated during construction would consist of materials such as motor fuels, heating fuels, paint, used acetone and paint thinner, waste oils, hydraulic fluids, cleaning solvent, cutting fluids, used batteries, and waste antifreeze. These hazardous materials would be containerized and properly disposed of by the individual contractors. Table 4-1 summarizes estimated quantities of hazardous materials and wastes that could be used and generated during the construction phase of the GBI and BMC3 sub-components as analyzed in the NMD Deployment EIS. Construction of the GBI VOC test site would be expected to require and generate smaller quantities.

Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's SWPPP and Project Spill Prevention, Control, and Countermeasure Plan that would be developed for each site. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with the 1995 Hazardous Waste and Hazardous Materials Standard Operating Procedure Manual as well as applicable Federal, state, and local regulations.

###### *Pollution Prevention*

Under the Proposed Action, the GBI VOC test site system-wide Pollution Prevention Plan would be implemented for proposed activities at Fort Greely. In addition, Fort Greely's existing Pollution Prevention Plan would be updated and implemented.

**Table 4-1: Hazardous Materials and Wastes—Construction Activities**

Source	Hazardous Material	Estimated Annual Usage in kilograms (pounds)	Estimated Annual Wastes in kilograms (pounds)
Construction equipment	Diesel fuel, gasoline, lubricants, oils, hydraulic fluids, antifreeze	100,000 (220,462)	100 (220.5)
Construction vehicles	Diesel fuel, gasoline, lubricants, oils, solvents	100,000 (220,462)	100 (220.5)
Contractor portable offices and personnel support facilities	Heating fuel, cleaning solvents	5,000 (11,023)	10 (22)
Paints, coatings and solvents	Paints, paint thinner	5,000 (11,023)	10 (22)
Portable electric generators	Diesel fuel, oil, lubricants	1,000 (2,204)	5 (11)
Storage batteries	Battery acid	100 (220.5)	1 (2.2)
Cloth rags, paper products	Oil, solvents	100 (220.5)	1 (2.2)

#### *Installation Restoration Program*

Prior to beginning construction, activities would be coordinated with appropriate installation personnel and state regulators to minimize impacts to remediation efforts and program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures could be taken to avoid human contact with any contaminated areas.

The Family Housing Landfill, referred to as Landfill 6, is located within the proposed GBI field site at Fort Greely and covers an area of approximately 4.5 hectares (11 acres). It was originally used for disposal of grubbing material and debris from the construction of the housing units. Although no documentation concerning landfill operations exists, the landfill was reportedly closed in 1960, and is now used as a disposal area for snow collected from the main cantonment area during the winter. This landfill would be avoided to the extent possible with the placement of the GBI silos. However, if ground disturbance is required, further investigations of the landfill may be necessary.

GBI VOC test site activities on Fort Greely are not anticipated to impact ongoing cleanup efforts. However, construction activities would be coordinated with installation personnel, state, and Federal regulators to ensure no conflicts develop.

#### *Asbestos*

Some of the facilities proposed for modification as part of the Proposed Action at Fort Greely may contain asbestos. Prior to any existing building modification or demolition, surveys would be conducted to determine if asbestos is present in the modification area. If asbestos is present, it would be removed and disposed of or encapsulated, depending on

its condition, before any modification or demolition is allowed to begin. Any asbestos removal work would occur in accordance with appropriate Federal, state, and local regulations by certified personnel.

#### *Polychlorinated Biphenyls*

There are no PCB-containing materials at Fort Greely. No PCB-based materials would be used as part of the Proposed Action.

#### *Lead-based Paint*

Some of the facilities proposed for modification as part of Proposed Action at Fort Greely may contain lead-based paint. Prior to any existing building modification or demolition, surveys would be conducted to determine if lead-based paint exists in the modification area. In most cases, lead-based paint would be encapsulated by painting. However, if lead-based paint cannot be encapsulated, it would be removed and disposed of in accordance with appropriate Federal, state, and local regulations before any modification or demolition is allowed to begin.

#### *Radon*

In areas where existing radon surveys have been found to exceed U.S. EPA recommendations, appropriate design techniques would be utilized for occupied facilities to ensure exposure levels would not exceed recommended levels.

### **Operations**

#### *Hazardous Materials Management*

Regular maintenance and operation activities at the GBI and BMC3 sites would involve a continuous but relatively low level of activity requiring the use of hazardous materials. The anticipated amounts of hazardous materials used at the site are not known but are expected to be small. They could include protective coatings, lubricants and oils, motor and generator fuels, cleaning agents (isopropyl alcohol), backup power batteries, adhesives, and sealants. These materials would be incorporated into Fort Greely's Oil Discharge Prevention and Contingency Plan and SWPPP as well as the 1995 Hazardous Waste and Hazardous Materials Standard Operating Procedure Manual. The hazardous materials would be stored in a centralized location for distribution when needed for maintenance. Material Safety Data Sheets would be posted at all locations where hazardous materials are stored or used.

A site-specific hazardous materials management plan and Spill Prevention, Control, and Countermeasures Program would be developed for the GBI VOC test site. The use and storage of hazardous materials would be in accordance with these regulations and applicable Federal, state, and local regulations.

One piece of equipment used on the EKV consists of a klystron tube, which contains small amounts of beryllium. Beryllium is listed on the Toxic Substance Control Act Inventory. If

maintenance were required, a new tube would be brought onsite and the replaced tube sent back to the manufacturer for repair.

The only new hazardous materials at the proposed GBI field would be the nitrogen tetroxide and hydrazine that constitutes the liquid propellant inside the EKV (8 liters [2 gallons] of hydrazine and 6 liters [1.5 gallons] of nitrogen tetroxide). The amount of solid propellant could be more per interceptor than that analyzed in the NMD Deployment EIS, but the total amount for the GMD VOC activities would be much less because of the fewer number of missiles that would be onsite. The NMD Deployment EIS described the integration of the entire GBI (rocket boosters and EKV) into a canister (creating a CAV) at an integration facility before shipment to the GBI VOC test site. Because of a potential change in the interceptor design configuration since the NMD Deployment EIS was published, there are now three revised concepts for integration of the GBI: The GBI may arrive at the GBI field totally assembled and fueled in the CAV as discussed in the NMD Deployment EIS-the analysis of which is incorporated by reference; the GBI and EKV components may arrive uncanisterized at the GBI field to be assembled onsite; or the GBI may arrive canisterized with the un-fueled EKV attached requiring the bi-propellant tanks to be installed in the MAB or EKV Assembly and Checkout Facility. These liquid propellants would be loaded within the EKV prior to emplacement of the GBI into the silo. The EKV bi-propellant tanks would be stored in the EKV Fuel and Oxidizer Storage facilities until mounted onto the EKV subassembly. The hydrazine, which is included in the EPA's Extremely Hazardous Substance List, would be reported to local authorities in accordance with the EPCRA. Both hydrazine and nitrogen tetroxide are reported in EPA's Toxic Substances Control Act Inventory.

Although Fort Greely has been realigned, it continues to be operated as a training range, which includes the use of hazardous materials and the generation of hazardous waste from testing long- and medium-range weapon systems, artillery, and rockets (U.S. Department of the Army, 1999). Operation and maintenance of the MAB or EKV Assembly and Checkout facility would slightly increase the amounts of hazardous materials used and hazardous waste generated at the installation. These would include paints, solvents, acids, bases, ethylene glycol, and alcohol. The Proposed Action would also require the incorporation of the liquid bi-propellant (fuel and oxidizer) into the site-specific hazardous materials management plan and Spill Prevention, Control, and Countermeasures Program. No hazardous waste from these components is anticipated to be generated. Existing procedures, personnel, and facilities would be used to manage the additional hazardous materials and wastes. Pollution prevention efforts would apply to assembly and checkout activities and pollution prevention plans and the 1995 Hazardous Materials and Hazardous Waste Standard Operating Procedures would be updated and implemented as required.

No more than two fully loaded missiles would be transported to the GBI VOC test site per month. A canisterized booster and separate fueled EKV could also be delivered. Only up to a total of 113.5 liters (30 gallons) of EKV liquid fuel is expected to be delivered to the site for storage and use. Transportation of propellants would be in accordance with U.S. Department of Transportation regulations. In addition, emergency response personnel and equipment would accompany the fueled EKV during transport to handle and contain hazardous materials in the unlikely event of an accident and spill during transportation.

The hazardous materials generated during the unlikely event of an accidental release during transportation would be disposed of in accordance with Federal, state, and local regulations.

#### *Hazardous Waste Management*

As discussed above, there would be minimal use of hazardous materials at the GBI field. Any hazardous waste generated from the use of these materials would be handled in accordance with appropriate Federal, state, and local regulations. Hazardous waste generated would be temporarily stored onsite before transfer to Fort Greely's main hazardous waste storage facility for appropriate disposal. The appropriate hazardous waste management plan would be developed for the site. Realignment of Fort Greely has changed the current hazardous waste practices on the installation, but the GBI VOC test site program personnel would work with environmental management at the host installation to ensure disposal of all hazardous waste in accordance with appropriate regulations.

Fort Greely has the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a release within the EKV should occur. If a release were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, a trained spill containment team would manage any release of the liquid propellants at the GBI VOC test site.

#### *Pollution Prevention*

A GBI VOC test site system-wide Pollution Prevention Plan would be implemented for proposed activities at Fort Greely. This plan would control and reduce the use of hazardous materials on the installation. In addition, the program would comply with the existing base Pollution Prevention Plan. Program personnel would continue to update the system-wide Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the Proposed Action.

#### *Installation Restoration Program*

One building at Fort Greely that is a potential support facility for the GBI VOC test site is on the State Priorities List: Building 605, which includes a maintenance shop, paint bay, and battery storage facility.

Currently scheduled investigations and remediation required at solid and non-solid waste management units, which include the site south of Building 626, the nuclear waste pipeline and dilution well, the 12 potentially contaminated areas within the cantonment area, and seven sources of potential contamination on properties adjoining the cantonment area would not be affected by the Proposed Action.

Environmental cleanup at Fort Greely has been addressed under both the IRP and the Base Realignment and Closure Environmental Cleanup Program. Numerous sites have been investigated and remediated under these programs. Investigations are now complete at all known sites. Cleanup of the nuclear waste line from the past activities of the SM-1A

nuclear reactor has been completed, and other cleanup actions at Building 110 and the old firefighter training pits are currently underway. Building 101, on retained property, and several other sites, on surplus property, are being characterized for the extent of contamination and scheduled for cleanup. (Spiers, 2001b) GBI VOC test site activities are not anticipated to impact these ongoing cleanup activities on Fort Greely.

#### *Asbestos*

No impacts from asbestos are anticipated during operation of the GBI VOC test site.

#### *Polychlorinated Biphenyls*

There are no PCB-containing materials at Fort Greely. No PCB-based materials would be used for the Proposed Action.

#### *Lead-based Paint*

No lead-based paint would be used in the new and modified proposed GBI VOC test site facilities.

#### *Pesticides*

Under the Proposed Action, pesticides used within the GBI VOC test site area would be EPA-approved and applied in accordance with Fort Greely's Integrated Pest Management Plan using personnel certified by the DoD as pesticide applicators. The small amount of pesticides required would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts at Fort Greely.

#### **Cumulative Impacts**

The construction and operation of a GBI VOC test site at Fort Greely in combination with ongoing Installation activities and future base reuse activities would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Fort Greely. It is anticipated that Fort Greely would return to its pre-base realignment status as a large quantity generator of hazardous waste. However, Fort Greely has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Fort Greely.

### **4.1.6 HEALTH AND SAFETY**

This section addresses the potential impacts to health and safety associated with construction and operation of the proposed GBI VOC test site on Fort Greely.

#### **Construction**

None of the proposed GBI facilities would fall within the airfield Clear Zones or within hazardous military operation areas on Fort Greely.

The construction of new facilities is routinely accomplished for both military and civilian operations and presents only occupational-related effects on the safety and health of workers involved in the performance of construction activity. Siting of the GBI VOC test site and any related support facilities would be in accordance with DoD standards, taking into account facility compatibility issues. All facilities would be designed to take into account regional natural hazards such as earthquakes, which would reduce the potential for one of these environmental factors causing a mishap at the GBI facility. With the appropriate design, earthquakes should not pose a potential significant risk to facilities and system components. Facility and equipment design would incorporate measures to minimize the potential for and impact of accidents. Construction materials would be delivered to the site by truck in accordance with U.S. Department of Transportation and Fort Greely regulations. Construction would be conducted in accordance with applicable regulations and permits and no impacts to health and safety are anticipated. Since many pilots use rivers and land features for navigation, and often fly close to the ground during low visibility conditions, poles and wires would be marked with high-visibility devices as required by the FAA (Bureau of Land Management, 1998).

## **Operations**

### *GBI and BMC3*

The GBI silos, MAB, Interceptor Storage Facilities, EKV Assembly and Checkout Facility, and EKV Fuel/Oxidizer Storage Facility would all require the establishment of ESQDs. The establishment of the ESQDs would go through DoD review to ensure there are no incompatible health and safety issues. The proposed ESQDs associated with the six GBI VOC test site silos would fall within the base boundary; therefore, an explosion of the GBI within the facilities should not pose a public health and safety risk.

During operation the GBI field would be dormant and BMC3 facilities unmanned except for the occasional maintenance and test activities and personnel in the Readiness Control Station. A fire department will remain on the base even after realignment of the cantonment area is completed. Fire protection, alarm, and suppression systems would be provided to GBI VOC test site facilities as appropriate. Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. At no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines. The potential for an aircraft mishap to occur over the GBI field would be remote.

Security requirements would be an integral component of program safety. Security measures would be incorporated within the project design and operation procedures. Components of test site security would include a security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. The clear zone on the inner side of the fence would contain remotely operated lights and cameras. All vegetation would be cleared inside the security fence. Vegetation would be cleared to approximately 15 meters (50 feet) outside the security fence.

Selected steps in the GBI installation would provide greater risk to human health, environment, and property, and therefore are evaluated for possible mishap scenarios.

Such possible mishap scenarios include mishandling of the missile components, accidents in transporting the GBI, liquid propellant mishaps, accidental launches, and natural hazards such as earthquakes.

**Transportation.** The interceptor boosters and unfueled EKV would be transported by air to the GBI VOC test site if an adequate runway is available at the site, then transported over the military installation by truck to the MAB and EKV Assembly and Checkout Facility. If no adequate runway is available at the GBI VOC test site the interceptor boosters and unfueled EKV would be transported by air to Eielson AFB. The interceptor boosters and components may be temporarily stored in a proposed Missile Transfer Facility at Eielson AFB (see section 2.2.5) before being trucked to the GBI VOC test site. The EKV bi-propellant tanks and large GBI related items (e.g., silos and silo liners) could be barged to Valdez, Alaska then transported over land by truck, transported from the manufacturer by truck, or shipped by rail; however, the shipping method has not been determined. The bi-propellant tanks would be stored in the EKV Fuel and Oxidizer Storage facilities until mounted onto the EKV subassembly. GBI components, sub-components and all fuels would be transported in accordance with U.S. Department of Transportation, U.S. Air Force, and U.S. Army regulations.

An aircraft accident during transportation is considered highly unlikely. The potential for a major (destruction of the aircraft) cargo aircraft accident is approximately 1 to 3 accidents per 100,000 hours flown. Overall, the potential for an aircraft accident while transporting the GBI would have no greater risk than any other commercial or military aircraft cargo flight and thus is considered very remote.

An accident of the transporter moving the GBI components from the landing base to the GBI VOC test site is also considered remote. Ground transportation of the GBI would be similar to that used for Minuteman and other DoD missile systems. The U.S. Air Force has a long record of safe handling and maintenance of missiles. Approximately 804,650 kilometers (500,000 miles) have been driven by transporter-erectors carrying Minuteman missiles (I, II, and III) between the deployment bases and the launch facilities. In roughly 30 years, only six rollover accidents have occurred, with none involving propellant ignition (U.S. Department of the Air Force, 1999—Final EIS, Minuteman III Missile System Dismantlement). Since the proposed transportation method would be similar to that used by the U.S. Air Force, it is expected that the potential for an accident and resulting fire or explosion would be remote.

A transportation safety plan in accordance with the appropriate DoD and U.S. Department of Transportation regulations would be written before any shipment, and transportation crews would receive the appropriate training in accordance with the plan. In addition, the emergency response personnel and equipment would accompany the GBI components during transport to handle and contain hazardous materials in the unlikely event of a release during transport.

**EKV Assembly.** The EKV would contain less than 19 liters (5 gallons) of liquid hypergolic propellants. Hypergolic propellants are fuels and oxidizers that ignite on contact with each

other and need no ignition source. This is the same amount and type of fuel and oxidizer described and analyzed in the NMD Deployment EIS. The fuel and oxidizer (bi-propellants) would arrive at the EKV Checkout and Assembly Facility or the MAB already loaded in bi-propellant tanks. A propellant detection system would detect an accidental release of the liquid bi-propellants. A release of either propellant could result in the release of hazardous materials inside the canister. The liquid bi-propellants tanks would have multiple safeguards, such as an internal bladder system, requiring several system failures before a release would occur, thereby making the potential for a release very remote. However, to estimate the type and magnitude of potential impacts, a catastrophic (and unlikely) event of an instantaneous release of each of the liquid bi-propellants was analyzed in the NMD Deployment EIS to evaluate the magnitude of the potential consequences. This catastrophic event would require penetration (e.g., by a forklift or a sharp object) of the liquid bi-propellant tank.

The health and safety analysis in the NMD Deployment EIS assumed the fuel was 100 percent monomethylhydrazine due to its greater toxicity in order to provide conservative results. The propellant is toxic and corrosive to the skin. A spark may easily ignite the vapors, and the liquid is not shock sensitive. Hydrazine-type liquid fuels present a serious fire hazard and a toxic vapor hazard and are suspected human carcinogens. Literature searches did not reveal any irreversible health effects from hydrazines resulting from levels of exposure below workplace exposure guidelines. The Occupational Safety and Health Administration (OSHA) has established the Permissible Exposure Level to monomethylhydrazine in a work environment at 0.35 milligrams per cubic meter (0.2 ppm).

Nitrogen tetroxide supports combustion of all hydrocarbons and is hypergolic with hydrazine. It is highly corrosive to human tissue. A pungent, acrid odor is detectable at 0.12 ppm; therefore, it is considered a substance with adequate warning properties. The OSHA Permissible Exposure Level for nitrogen tetroxide (as nitrogen dioxide) is 9 milligrams per cubic meter (5 ppm). The Immediately Dangerous to Life or Health exposure limit for nitrogen dioxide is 38 milligrams per cubic meter (20 ppm). Exposure to low-levels of fumes may cause eye and nose irritation and yellow staining of the skin. Higher levels of exposure (10 to 20 ppm) have resulted in reports of mild irritation (Center for Disease Control and Prevention, 1995). At higher levels of exposure (25 ppm), there is respiratory irritation with cough and chest pain. Exposure to levels of nitrogen dioxide vapors below workplace exposure guidelines is not known to result in irreversible damage.

A release would be conservatively characterized as an evaporating liquid, or as a gaseous cloud that is generally neutral buoyant, or heavier than air. A class of dispersion models, commonly known as cold spill models, was developed to model the dispersion of neutrally buoyant or denser-than-air gases produced from liquid spills. The U.S. Air Force Toxic Program was used to model these releases and to provide an estimate of downwind concentrations. Only cold spills were evaluated because, in general, spills involving unreacted hypergolic propellants pose the greatest health hazard to human and ecological populations.

A release of the liquid bi-propellants was modeled assuming an instantaneous outdoor release (e.g., the entire container leaks at once). A propellant detection system would be in place during bi-propellant tank installation and emergency equipment would be near facility. Table 4-2 shows the results of modeling. Only a release of the nitrogen tetroxide is expected to exceed the OSHA Permissible Exposure Limit for workers. The most likely area for this to occur would be within the MAB, EKV Assembly and Checkout Facility, Interceptor Storage Facility, and the GBI missile field. Hazardous emissions from a propellant release at Fort Greely could affect up to 14 hectares (35 acres) of land outside the base boundary. However, the potentially affected area is undeveloped and there are no public structures or roads.

**Table 4-2: Results of U.S. Air Force Toxic Program Modeling**

Standard	Monomethylhydrazine		Dinitrogen Tetroxide	
	Guidance in milligrams per cubic meter (parts per million)	Exceedance Distance	Guidance in milligrams per cubic meter (parts per million)	Exceedance Distance
OSHA Permissible Exposure Limit	0.35 (0.2)	Not applicable <sup>(1)</sup>	9 (5)	760 meters (2,493 feet)
Immediately Dangerous to Life or Health	38 (20)	Not applicable <sup>(1)</sup>	38 (20)	Not exceeded

<sup>(1)</sup> Safe exposure levels should not be exceeded under most meteorological conditions. Any exceedance would be less than nitrogen tetroxide distances and contained within the site boundary.

An indoor release would be expected to result in a much shorter exceedance distance. Neither liquid propellant would exceed the Immediately Dangerous to Life or Health standard. The level of exposure for the nitrogen tetroxide as a result of a release would not cause irreversible damage. Exposure at these levels would be mildly irritating to the eyes and nose and could include coughing.

Facility and equipment designs would incorporate measures to minimize the potential for and impact of accidents. A sensor system could be used to monitor the condition/status of the EKV propellant system during installation and checkout operations. Operating procedures and training would be instituted to minimize the potential for and impact of releases of hazardous materials. Specific health and safety plans would be developed including evacuation plans, and notification of local and offsite emergency response as required. An emergency response team would be on call during tank installation. The local fire departments (within a 161-kilometer [100-mile] radius) would be notified through the existing cooperative agreements with the installation.

In the event of a liquid bi-propellant release, the emergency response team would ensure the area would be evacuated, ignition sources would be removed, and vapors would be ventilated. All liquid would be contained for treatment and neutralization and disposed of in accordance with all applicable regulations. Releases would be absorbed with appropriate materials and transferred to containers for disposal. (Raytheon Electronic Systems, 1999)

The primary health and safety issue associated with the BMC3 is the potential for EMR impacts to personnel and the public. During normal operations, the IDT and DSCS would not transmit except during testing of the equipment. A power/calibration test of the transmitter would occur once a year. During this test EMR would be generated by the IDT, but EMR levels would not exceed established personnel exposure limits. No impacts to health and safety are anticipated from operation of the GBI VOC test site components.

**GBI Integration.** The Class 1.1 propellant that could potentially be used in the GBI is principally considered a blast hazard, although in a fire it will burn at a rate comparable to that of rubber tires. If detonated, Class 1.1 propellant would produce blast overpressure and fragments beyond 305 meters (1,000 feet) (U.S. Department of the Air Force, 1992).

Accidental ignition of solid propellant can be caused by static discharge, lightning, or a nearby fire or explosion. Lightning strikes and static discharges are very unlikely events. In the 30 years of operations in the Minuteman Missile Wing, there has been no record of lightning striking a transporter. Measures would be taken to prevent static buildup during transportation. Additionally, impact of the rocket motor casing against any object or penetration of the rocket motor's casing may produce enough internal or external frictional energy release to cause ignition. However, detonation resulting solely from an impact is highly unlikely.

Results of modeling for the NMD Deployment EIS indicated that peak hydrogen chloride emissions from a detonation would be 14 milligrams per cubic meter, which is well below the Immediately Dangerous to Life or Health exposure limit of 75 milligrams per cubic meter. The peak 1-hour time-weighted average would be 1.3 milligrams per cubic meter, which is also below the Short-Term Public Emergency Guidance Level of 1.5 milligrams per cubic meter.

Integration and assembly of the GBI components could include installing electronics, wiring, and ordnance in each of the stages; mating the stages together; and mating the EKV to the flight vehicle. Facility designs would incorporate measures to minimize the potential for and impact of accidents. Operating procedures and training would be instituted to minimize the potential for and impact of releases of hazardous materials. Appropriate emergency response plans would be established and implemented to deal with potential chemical release. In the event of a liquid propellant leak, the area would be evacuated, ignition sources would be removed, and vapors would be suppressed with a water fog. All liquid would be contained for treatment and neutralization and disposed of in accordance with all applicable regulations. Small spills would be absorbed with earth, sand, or other non-combustible materials and transferred to containers for disposal.

Current plans for the GBI include a sensor system to monitor the condition/status of the EKV propellant system. A specially designated emergency response team would handle a leak with appropriate equipment at the site to reduce any health and safety risk to workers and the general public.

As part of standard fire fighting practices on Fort Greely, fire breaks would be built around any proposed GBI VOC test site location. The fire protection status required for the proposed activities would be Full Protection, which refers to areas that receive maximum detection coverage and immediate and aggressive initial response. For the GBI component, this fire protection status would have to be changed to Critical Protection, which refers to land that receives maximum detection coverage and is of the highest priorities for response. This status along with the appropriate fire breaks and fire equipment should limit the potential for forest fires spreading into the proposed GBI field.

GBI handling would be in accordance with standard safety procedures developed by DoD for the handling of solid and liquid propellants. Most of the procedures that would be utilized are based on those used for the Minuteman and other military systems where a long history of safety procedures has been developed; therefore, handling the GBI would not present a significant health and safety risk. In addition, separation of the GBIs in the silos would prevent any potential for a mishap impacting more than one GBI at any time.

A health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary. Cooperative agreements with local fire departments would need to be updated to inform them of the additional hazards and safety considerations of the GBI VOC test site.

#### *Allen Army Airfield Repair*

Use of the Allen Army Airfield for the NMD Program was considered as part of the High Forecast Scenario in the 2000 *Allen Army Airport Master Plan* (City of Delta Junction, 2000). No health and safety impacts were identified. The use of the airfield included delivery of up to 100 GBIs and 4 to 5 flights per year for missile maintenance. Repair of the airfield for the GBI VOC test site activities would fall within these use parameters. (City of Delta Junction, 2000) The use of the airfield to fly in equipment and personnel for GBI VOC test activities would potentially mitigate the risk inherent in highway movement.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

The landfill area would remain fenced to limit access to site workers. In addition, limited operating hours would minimize exposure of waste to humans and ecological receptors. Therefore, long-term impacts during operation of the expansion area are not anticipated.

No health and safety impacts associated with other proposed activities (electricity upgrades or mancamps) are anticipated.

#### **Cumulative Impacts**

Potential cumulative health and safety impacts are not expected to occur at Fort Greely with the combination of the proposed activities and ongoing health and safety risk from current military activities. No new or future programs are planned that could add to potential cumulative impacts. The main cumulative impacts could come from a potential

increase in fires or a combination of hazardous activities increasing the health and safety risk.

#### **4.1.7 INFRASTRUCTURE**

This section addresses the potential for impacts to infrastructure due to the proposed construction and operation of the GBI VOC test site.

Fort Greely has been realigned and therefore the number of personnel assigned to Fort Greely has been reduced. This has resulted in a loss of approximately 700 personnel. This reduction in the number of personnel has resulted in an increase in available utility capacities. GBI VOC test site construction and operation would result in an increase of up to approximately 400 personnel, which is only 57 percent of the estimated personnel reduction; therefore, there should be sufficient utility capacity in the ROI and on base to handle GBI VOC test site activities.

##### **Solid Waste**

Several alternatives exist in order to fulfill the solid waste disposal needs of the GBI VOC test site. The preferred alternative would be to open a sixth cell in the existing Fort Greely landfill area. Alternatives include constructing a new construction debris landfill and access road in the vicinity of the existing landfill at Fort Greely and placing inert construction debris on top of existing closed cells at the Fort Greely landfill. Solid waste could also be transported to the North Star Landfill in Fairbanks. The potential solid waste impacts for construction and operation of the GBI VOC test site are combined and discussed below.

Based on preliminary investigation and analysis in the NMD Deployment EIS, it was determined that approximately 400 construction workers would be in the Fort Greely area for 2 years and that up to 360 employees would be required to support the operational phase of the GMD VOC activities. For the purposes of this evaluation it is assumed that any new landfill construction at Fort Greely would be developed for Fort Greely use, and not the surrounding Delta Junction region.

The per capita solid waste generation rate, based on the Fort Greely rate in 1995, would be approximately 1.8 kilograms (4 pounds) per person per day. Assuming no waste volume reduction, the maximum projected municipal solid waste to be handled for the construction personnel population of 400 would be approximately 3.4 cubic meters per day (4.4 cubic yards per day), or 1,228 cubic meters per year (1,606 cubic yards per year). The maximum projected municipal solid waste to be handled for the operational personnel population of 360 would be approximately 3 cubic meters per day (4.0 cubic yards per day), or 1,105 cubic meters per year (1,445 cubic yards per year). However, continued open pit burning operations are recommended as both a volume reduction and long-term cost savings measure.

Assuming volume reduction through open pit burning, with 50 percent of the collected waste considered burnable and a 90 percent volume reduction of the burnable waste

through open pit burning (as based on burn operation data from Fort Greely), the maximum projected volume of ash and non-burnable municipal solid waste to be disposed of during construction would be approximately 1.8 cubic meters per day (2.4 cubic yards per day), or approximately 675 cubic meters per year (883 cubic yards per year). The maximum projected volume of ash and non-burnable municipal solid waste to be disposed of during operation would be approximately 1.7 cubic meters per day (2.2 cubic yards per day), or approximately 608 cubic meters per year (795 cubic yards per year). At this rate of use, a cell based on current design would be filled in approximately 10 years.

Expansion of the Fort Greely landfill would be in accordance with 18 AAC 50 Alaska Air Quality Control regulations, which outline requirements for permits needed to ensure compliance with ambient air quality standards. If a new landfill were to be constructed at Fort Greely, a new permit application would be required by ADEC. The application must be submitted to ADEC a minimum of 60 days prior to any construction activity. In addition, a 30-day public notice period would be required. However, it is anticipated that a new permit would be obtained without difficulty.

In addition to ADEC solid waste regulations, other regulatory requirements could be applicable, as well, such as 18 AAC 60 Solid Waste Management, which provides requirements for construction, modification, operation, and closure of landfills.

Hauling solid waste by a private contractor to the North Star Landfill in Fairbanks could be conducted by compactor truck, or require construction of a small transfer station, resulting in greater costs to the program. Haul by GMD VOC personnel is assumed to be impractical due to lack of enforcement or accountability for potential illegal dumping. The transfer station would require disturbance of approximately 2 hectares (5 acres) of additional land.

If a transfer station is utilized, the use of two 31-cubic-meter (40-cubic-yard) transfer trailers has been recommended. Trailers would be located at the transfer station for temporary storage of waste. Smaller transport vehicles would haul solid waste to the transfer station. When the trailers reach capacity, they would be hauled to the North Star Landfill. As a result, hauls could be required approximately every 5 to 7 days. Compliance with regulatory requirements is anticipated. No additional requirements to the existing North Star Landfill would be necessary.

## **Construction**

### *GBI and BMC3*

**Water.** During construction, it is expected that an increase in water use would occur on base as a result of construction personnel and activities usage as well as Government and Prime Contractor personnel living in the on-base administrative mancamp. According to analysis in the NMD Deployment EIS, construction worker-related potable water usage would be approximately 0.12 million liters per day (0.03 million gallons per day). The base potable water system has an available capacity of 3 million liters per day (0.8 million gallons per day). Thus, the existing potable water system at Fort Greely has sufficient available capacity for construction personnel and activities. It is also possible that nonpotable water may be used from Jarvis Creek for construction activities. If so, all

necessary permits will be obtained. Other on-base water usage from construction would be related to site watering and any required batch plants. The available capacity would be sufficient to handle this demand.

Since some of the proposed facilities would be located away from the existing base water system, two new 1,893 liters (500 gallons) per minute wells were constructed during initial site preparation activities in 2001. Any additional wells or proposed water system would be constructed in accordance with local and state regulations and would be certified as required.

**Wastewater.** During construction, it is expected that most of the wastewater increase would occur on-base as a result of construction personnel and activities usage as well as Government and Prime Contractor personnel living in the on-base administrative mancamp. According to analysis in the NMD Deployment EIS, construction worker-related wastewater generation would be approximately 0.12 million liters per day (0.03 million gallons per day). The wastewater system on the installation had an available capacity of 0.50 million liters per day (0.13 million gallons per day) when all buildings were in use. The increase in wastewater usage would be well within the available capacity. Portable wastewater facilities would be used for construction workers during the workday on Fort Greely.

Since the main GBI VOC test site facilities would be located away from the existing wastewater system, up to five new septic wastewater facilities would have to be constructed. The proposed new system would be constructed in accordance with local and state regulations and would be certified as required.

**Electricity (Electricity Distribution Upgrades).** Golden Valley Electric Association would construct a new 138-kV power transmission line from the Jarvis Creek substation to the Fort Greely GMD VOC test site. This new transmission line would furnish all power required for the GBI VOC test activities. There would be no adverse impacts to the current electrical system in the region.

#### *Mancamp*

Lighting would be installed for security and parking at the administrative mancamp location. All utility services would be provided by the Government, and would be brought to the site with minimum connectivity and there would be no impact to the existing system. Electricity would be provided by Golden Valley Electric Association, with backup power provided by the onsite substation as needed.

Site 2, the preferred location for a mancamp on Fort Greely, is close to an underground utility corridor that supplies electricity, water and sewer service. An electric power transmission line crosses the area and there is road access from all sides. Site 3 has no access roads or nearby utilities and would require further extension of utilities from the cantonment area.

## **Operations**

### *GBI and BMC3*

**Water.** Most of the operations-related water usage would occur on-base. Water usage would be expected to increase by 0.07 million liters per day (0.02 million gallons per day), based on the increase in operational personnel, which is within the available base capacity. Two new potable water wells were constructed in 2001 and would be operated in accordance with local and state regulations as required.

**Wastewater.** Wastewater generation would be expected to increase slightly, based on the increase in personnel for operation, which is within the available base capacity.

**Electricity (Electricity Distribution Upgrades).** The proposed electricity upgrades would provide the 5 MW of electricity required for the proposed GBI VOC test site activities.

### *Mancamp*

All utility services for the administrative mancamp would be provided by the Government, and would be brought to the site with minimum connectivity. Electricity would be provided by Golden Valley Electric Association, with backup power provided by the onsite substation as needed.

## **Cumulative Impacts**

Some additional new military construction is expected to occur on Fort Greely. The construction programs, which consist mostly of range upgrades to infrastructure including the construction of two water wells during initial site preparation in 2001, the construction of leach fields, and septic tanks would result in the increase in utility demands. Increases in utility demand would be accommodated through the construction of a new 138-kV power transmission line from the Jarvis Creek substation to the Fort Greely GMD VOC test site. It is not expected that reuse of the post area in combination with the GMD VOC test site activities would exceed any of the operational capabilities of the existing infrastructure system.

### **4.1.8 LAND USE**

This section addresses the potential impacts to regional and installation land use due to the construction and operation of the GBI VOC test site on Fort Greely.

## **Construction**

### *GBI and BMC3*

Construction of the new facilities at Fort Greely could include a GBI field, an EKV Assembly and Checkout Facility, a MAB, three Interceptor storage facilities, additional support facilities, FOC, and access roads to the site. This construction would occur within an area of approximately 162 hectares (400 acres). The new construction would be of an industrial nature and would be similar to the functions of the existing military facilities.

The proposed activity would take place south of the Main Cantonment Area in the Main Post Area in an area referred to as the Jarvis Site. Adjacent land use and zoning is compatible with activities on Fort Greely. This area is primarily used as a non-firing maneuver area, air drops, training, and troop maneuvers. Fifty-four hectares (134 acres) of land have undergone initial site preparation activities. Approximately 108 hectares (266 acres) of additional undisturbed land would be altered to accommodate the new facilities, which is small portion of the total land base of Fort Greely. The siting of the GBI field and support facilities would be in accordance with DoD standards taking into account ESQD and EMR safety criteria. All of the construction areas fall well within the boundaries of Fort Greely and therefore have no conflicts with adjacent land uses or zoning, and there are no inhabited structures within proximity to the construction sites. Construction would impact the use of this area by the U.S. Army as a training area. However, this is a very small portion of the total land available at Fort Greely for training, and the impact of losing this small portion of the training area would be minimal.

#### *Electricity Distribution Upgrades*

The Federal government (Bureau of Land Management and DoD) manages the majority of the land that could be affected by the proposed activities. The alternative routes are located on land that is primarily undeveloped open space and forest that is sparsely populated. The closest inhabited structures, other than military, are in Delta Junction. Two scenic outlook sites are located along the western side of Richardson Highway. Dulled metal finishes could be used on all poles and wire to minimize potential visual impacts, if applicable, and clearing would be minimized to the extent practicable.

#### *Allen Army Airfield Repair*

The GBI component on Fort Greely may require repair of the existing runway. This activity would not change any existing land uses or airfield safety zones and would be consistent with the current uses of this area.

#### *Mancamp*

The new construction would be of an industrial nature and would be similar to the functions of the existing military facilities.

#### **Operations**

The GBI field would be in a dormant state during the operation phase with the exception of testing and occasional maintenance. There would be an ESQD established around the GBI field, MAB, and Interceptor Storage Building. The ESQDs would fall within the proposed site and would be a compatible land use. They would not affect any of the existing facilities at Fort Greely or any of the surrounding land uses. There would be a small loss of land used for training activities, recreational activities, and hunting due to construction and operation of the Proposed Action.

#### **Cumulative Impacts**

Construction and operation of a GBI VOC test site at Fort Greely would only affect a very small portion of the base compared to the overall size of Fort Greely and would create no

zoning or land use conflicts. The potential area for the GBI VOC test site is designated for military use and is currently used to conduct military activities. The GBI VOC test site may require the use of some facilities in the cantonment area for housing, administrative, or maintenance-related purposes. No other projects have been identified by Fort Greely that would contribute to cumulative land use or aesthetic impacts.

#### **4.1.9 NOISE**

This section addresses the potential impacts to the noise environment due to the construction and operation of the GBI VOC test site on Fort Greely.

##### **Construction**

Noise from construction equipment usually falls in the range of 70 dBA to 98 dBA at 15 meters (50 feet) from the source, with earth moving equipment, jack hammers, and rock drills being the noisiest pieces of equipment in this range. The one exception is pile drivers, which fall in the range of 95 dBA to 106 dBA at 15 meters (50 feet). Under current planning, pile drivers would be used for the GBI construction at Fort Greely.

As assumed in the NMD Deployment EIS, construction of GBI, BMC3, support facilities, and the administrative mancamp at Fort Greely would take place 24 hours per day during the summer months. Therefore, due to the 10 dBA penalty added to nighttime noise, the 65 dBA and 75 dBA contours are estimated to occur within approximately 1.9 kilometers (1.2 miles) and 0.87 kilometer (0.54 mile) from the construction site, respectively.

However, since no noise sensitive receptors are known to exist within 1.9 kilometers (1.2 miles) of the proposed GBI VOC test site at Fort Greely, no impacts to the noise environment would be expected from construction equipment noise.

GBI VOC test site construction activities would have a neutral effect on the area traffic volumes due to realignment activities at Fort Greely. Consequently, no impacts from traffic noise during construction are expected.

##### **Operations**

According to analysis in the NMD Deployment EIS, up to approximately 720 vehicle trips per day would be added to the Richardson and Alaska Highways during operation of the GBI VOC test site. Realignment of Fort Greely has reduced personnel numbers from 750 to approximately 66 since July 2001. This reduction has left a net decrease in the traffic volume on-base and in the surrounding area. Consequently, no impacts from traffic noise during operation of the GBI VOC test site would be expected.

##### *Allen Army Airfield Repair*

Repairs to the airfield would result in a small increase in flights arriving and departing from Fort Greely. However, as no noise sensitive receptors are known to exist within 1.9

kilometers (1.2 miles) of the airfield, no substantial impacts to the noise environment would be expected.

### **Cumulative Impacts**

As no noise sensitive receptors have been identified in the vicinity of the construction site, no cumulative impacts to the noise environment are anticipated.

The net effect of realignment, reuse, and GBI VOC test site activities on Fort Greely could be an increase of up to 360 persons from the total employment before realignment. This employment increase would cause the traffic volumes on-base and in the area to increase accordingly. However, the location of the 67dBA  $L_{eq}(1 \text{ hour})$  is estimated to occur well within the approximate 91-meter (300-foot) right-of-way. Consequently, no cumulative impacts from traffic noise are expected.

## **4.1.10 SOCIOECONOMICS**

This section addresses the potential impacts to regional socioeconomics due to construction and operation of the GBI VOC test site at Fort Greely.

### **Construction**

#### *Population*

Construction of GBI facilities would take approximately 2 years, employing on average 400 construction workers a year. It is expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. Fairbanks, the nearest community of any size, had just over 1,800 construction workers in 1996 but, with this exception, there is no local pool of labor on which to call for this type of project.

Typically, about 70 percent of construction workers relocate to the area from elsewhere in the United States. If 70 percent of the construction workers for the GBI VOC test site came from outside the area, then 120 workers would come from the local labor pool. The experience gleaned from previous construction and environmental projects at Fort Greely supports the view that the local labor pool of construction workers would support this ratio of local workers to newcomers.

While a project of this scale might be expected to attract dependents, as well as the construction workers themselves, the distance of Fort Greely from main population centers, the lack of available housing and other facilities, and the experience of other construction projects at the base would suggest that the ratio of dependents to workers would be very low. Those bringing dependents with them for previous projects at Fort Greely have, typically, housed them in Fairbanks or Anchorage.

#### *Employment Income and Retail Impacts*

The GBI VOC test site construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction

workers. A proportion of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, at local stores and from local suppliers, would generate additional income and jobs within the local economy.

At least half of the overall construction cost would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. While some non-contract jobs might be created in the communities surrounding Fort Greely, the majority would be in Fairbanks and Anchorage where much of the expenditure would be made.

The impact of construction program expenditures on retailers would be almost entirely concentrated in Fairbanks, as there are few retail outlets in the communities surrounding Fort Greely.

#### *Impacts on Housing, Education, and Health*

Most construction workers who have been involved in past projects at Fort Greely have been accommodated at the base or have commuted from Fairbanks. Some have found accommodation in the surrounding communities of Delta Junction and Big Delta. Fort Greely has an existing stock of accommodation, available as a result of the Base Realignment Plan. However, an administrative mancamp may be established at Fort Greely that would provide office space for approximately 120 personnel and living and dining facilities for 200 personnel. Section 4.5.2 discusses the socioeconomic impacts of housing construction workers in Delta Junction.

Primary emergency care would be provided to the construction personnel at the reopened health facility on Fort Greely. The hospital network in Fairbanks would deal with the more serious and longer-term care needs of the construction workers, as they arise. The medical facilities in Fairbanks are adequate to handle the increased demand.

Only a very small number of construction worker dependents are likely to live in the ROI. There would, therefore, be only a small additional enrollment in the local school districts as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

#### *Fiscal Impacts*

The main fiscal impact arising from the construction phase would be as a result of purchases made by personnel and their families. Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

## **Operations**

### *Population*

The operational phase of the GBI VOC test site could directly employ up to 360 personnel, including approximately 115 military and 95 contract positions with an additional 150 direct jobs associated with GMD base support functions mostly joining the project from outside the region. Because there is a small number of existing base support personnel at Fort Greely, the GBI VOC test site would require more personnel than at the alternative GBI VOC test site location at Clear AFS.

Given the specificity of the skills required for the operational phase, almost all those involved would move to Fort Greely from outside of the area. As stated above, it would be expected that few, if any, dependents would accompany the workforce, all of whom would be encouraged to live at Fort Greely rather than in the surrounding community or in Fairbanks.

### *Employment Income and Retail Impacts*

The operational phase of the GBI VOC test site would qualify as one of the preferred uses for this location, as stated in the Fort Greely Final Reuse Plan. As its preferred alternative, the Plan has defined a mixed use industrial complex anchored by, among other activities, a military use. The GMD VOC test site at Fort Greely would qualify as this military use. The NMD Deployment EIS estimated that approximately 360 direct jobs and at least \$9.7 million of direct income would be generated per year. It is estimated that approximately 108 jobs would be generated indirectly by the operational phase of the action.

## **Cumulative Impacts**

The program to construct a new power line from the Richardson Highway to the Alascom Microwave Site would add to the positive economic impact if it overlapped with the Proposed Action.

The siting of the GBI VOC test site at Fort Greely would have a positive cumulative economic impact that would slightly mitigate the negative economic impact of the Base realignment.

## **4.1.11 WATER RESOURCES**

This section addresses the potential impacts to water resources due to construction and operation of the GBI VOC test site on Fort Greely.

## **Construction**

### *GBI and BMC3*

During the 2-year construction period, approximately 162 hectares (400 acres) additional areas of undisturbed land could be altered to accommodate the GBI, IDT, and DSCS facilities and access roads, which is roughly 3 percent of the main post area. Of the total

land required, approximately 54 hectares (134 acres) of land at Fort Greely was previously disturbed during initial site preparation activities in 2001. No impacts to water resources during the site preparation activities occurred in 2001 or are anticipated to occur from the proposed construction for the GBI VOC test site. The proposed GBI and BMC3 sites are not within the 100-year floodplain. Due to the relatively level topography and low precipitation, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.1.5, Hazardous Materials and Hazardous Waste Management.

Since construction would result in the disturbance of more than 2 hectares (5 acres) of land the activities would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit that would be filed with the EPA would also be provided to ADEC. A copy of the SWPPP would also be provided to ADEC. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the EPA and ADEC.

Two 1,893 liters (500 gallons) per minute potable water wells were established during initial site preparations activities in 2001. As analyzed in the NMD Deployment EIS, the water requirements for the construction workforce would be approximately 0.12 million liters per day (0.03 million gallons per day). These water requirements represent approximately 10 percent of the water use when all buildings were in use. The construction water requirements would result in a total installation usage of approximately 32 percent of the available water well capacity. With this small increase in water usage and the more than adequate recharge of the aquifer by the Delta River, the water requirements would not impact the water supply aquifer.

BMC3 construction activities could result in the disturbance of up to 7 hectares (17 acres) of land per sub-component and would also be subject to Federal NPDES permitting requirements. The water requirements for construction work and water for the construction workforce would be approximately 9,400 liters per day (2,483 gallons per day). The withdrawal of this amount of water would not be expected to impact most water supply aquifers and surface water sources.

#### *Electricity Distribution Upgrades*

Construction activities as part of the electric distribution upgrades would include a new power transmission line from the Jarvis Creek substation to the Fort Greely test site and would require placing poles along the east or west side of the Richardson Highway. Impacts to water resources would be associated with trenching and pole emplacement,

which would be short-term. Disturbance to stream channels, drainage patterns, and stream banks would be minimized to the extent practicable.

#### *Solid Waste Landfill Extension/Construction Debris Disposal*

Construction of the landfill extension or the new landfill and placing inert construction debris such as concrete rubble on top of the existing closed cells could potentially result in impacts to water resources. BMPs such as limiting the exposure area, creating collection basins, use of geotextiles, and application of dust suppression methods would be used to reduce the potential for impacts to water resources. The current landfill is located in a region where groundwater exists at 61 to 91 meters (200 to 300 feet) below ground surface. Therefore, short-term impacts to groundwater sources during construction of the expansion are not anticipated.

#### *Allen Army Airfield Repair*

Repair of the airfield would involve excavating approximately 1 meter (4 feet) down from the top of the runway and rebuilding the section with 102 centimeters (40 inches) of compacted sub-base, a 15-centimeter (6-inch) drainage layer, 10 centimeters (10 inches) of new asphalt, and upgrades to the stormwater collection system. BMPs would be used and could include storm water control measures such as detention areas, and constructed wetlands or ponds to contain runoff from the impervious areas at GBI VOC test site facilities.

#### *Mancamp*

The preferred location for construction of the administrative mancamp is on a 14.5-hectare (36-acre) area east of the existing housing area as shown in figure 2-12. However, only a small portion of the selected site would be cleared, leveled, and graveled. Construction impacts would be similar to those discussed above for the GBI and BMC3 sub-components, on a smaller scale. Impacts would be basically the same for all alternative locations, although use of Site 3 would require construction of access roads.

#### **Operations**

Once construction and landscaping is complete, there should be little erosion and runoff, and no impacts to water resources are anticipated.

#### **Cumulative Impacts**

Construction and operation of a GBI VOC test site at Fort Greely would only affect a very small portion of the base compared to the overall size of Fort Greely. Although the facilities would result in increased runoff and potential decrease in water quality, measures would be incorporated into the final design at each location to maintain the pre-GBI VOC test site storm water runoff levels and quality so as not to contribute to cumulative impacts. Currently there are several projects planned along with most of the cantonment area being excessed. Potential impacts from maneuver exercises would not apply within the ROI as the land will no longer be used for maneuvers. No other future programs have

been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts.

#### **4.1.12 ENVIRONMENTAL JUSTICE**

This section addresses the potential environmental justice impacts due to construction and operation of the GBI VOC test site at Fort Greely.

An environmental justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population. The potential for a disproportionately high and adverse effect could occur under either of two conditions:

- The percentage of persons in low-income or minority populations in the census area meaningfully exceeds the percentage in the regions of comparison.
- The percentage of low-income or minority population in the census area exceeds 50 percent.

#### **Construction and Operation**

Potential environmental justice impacts at Fort Greely were addressed in the Alaska Army Lands Withdrawal Renewal Final Legislative EIS and the NMD Deployment EIS, which concluded that there would be no disproportionately high and adverse environmental or human health effects on low-income or minority populations.

#### **Cumulative Impacts**

No other projects or activities in the region have been identified that would contribute to potential cumulative environmental justice impacts.

### **4.2 EARECKSON AS, ALASKA**

As discussed in chapter 2, Eareckson AS is a proposed location to establish the BMC3 component, and associated facilities to support GBI VOC test site activities. Proposed activities at Eareckson include construction and operation of one IDT; construction and operation of two co-located DSCS earth terminals; software and hardware upgrades to the existing COBRA DANE radar; construction of terrestrial FOC; overhaul or refurbishment of the existing power plant; establishment of a mancamp; and development of a beach landing and staging area.

Resources that have a potential for impacts were considered in the analysis to provide the decision makers with sufficient analysis for evaluation of potential effects of the action. Initial analysis indicated that the Proposed Action would not result in short-or long-term impacts to socioeconomics.

Under the Proposed Action, there would be a minimal personnel force associated with the construction and operation of the GBI VOC test site. In addition, construction of the site would create minimal construction-related jobs. Therefore, there would be no impact to local or regional socioeconomic resources, and this resource area is not analyzed further.

#### **4.2.1 AIR QUALITY**

This section addresses potential environmental impacts caused by changes to the air quality environment due to the proposed construction and operation of an IDT, two co-located DSCS earth terminals, and mancamp, refurbishment of the existing power plant, and the establishment of a staging area.

##### **Construction**

Activities at Eareckson AS would occur in the main base cantonment area. The IDT, two co-located DSCS earth terminals, and staging area sites would require minimal ground disturbance over an 18-month construction period. Construction activities associated with the power plant would occur in existing facilities and not involve any ground disturbance.

The proposed construction of the new facilities would cause temporary localized increases in air emissions. However, this would not require modification of Eareckson's Title V operating permit. The Alaska Department of Environmental Conservation has determined that the proposed GMD VOC test site at Eareckson AS would be a new facility, separate from the U.S. Air Force for air permitting purposes. (Baumgartner, 2002). Emissions associated with construction activities include fugitive dust from ground disturbance, combustion byproducts from construction equipment, and emissions from solvents and architectural coatings.

Ground disturbance would generate dust (PM-10) in the immediate vicinity of the construction. The levels of dust generated would change through time depending on the level of activity, the weather, and the condition of the ground itself. It is expected that the majority of grading would be accomplished during the first several months of construction and that overall ground disturbance would only occur for approximately 18 months.

Potential emissions from mobile and stationary construction equipment as well as asphalt and architectural coating activities are also considered in the air quality analysis. As stated above, it is assumed the majority of the heavy equipment activities would be accomplished during the first 18 months.

##### ***Mancamp***

The preferred location for construction of the mancamp is in the vicinity of Foundation Village near the center of the island as shown in figure 2-5. The selected site would be cleared, leveled, and graveled. Construction impacts would be similar to those discussed above for the IDT and DSCS components on Fort Greely, but on a smaller scale.

Construction activities would be conducted in accordance with applicable regulations and permits. Related emissions would be intermittent and would not be anticipated to cause exceedances of air quality standards. As such, the proposed construction would have minimal impact on air quality.

### **Operations**

The IDT and two co-located DSCS earth terminals would be powered by the existing onsite power plant source with backup emergency generators. Based on current program plans, one 250- to 300-kW backup generator for the IDT and thirty-two 30 kW microturbine generators for the DSCS would be operated for maintenance cycling and emergency power conditions in accordance with applicable permits. The generators would be fueled through two 2,460-liter (650-gallon) day tank ASTs, and two 34,068-liter (9,000-gallon) ASTs, also used under applicable permits. This varies somewhat from the information previously provided to the State of Alaska (Baumgartner, 2002) and will be reflected in the eventual air permit. Small amounts of materials involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as the Title V Air Permit. Maintenance-related emissions are not addressed further in the air quality analysis.

At some of the proposed sites, a small amount of road upgrade or paving may be required. This activity would not cause significant air quality impacts at the respective sites.

### ***Mancamp***

The mancamp would provide office space and living accommodations for a minimum of 35 and a maximum of 200 personnel. Utilities are anticipated to be provided by existing on-island resources.

Overall, installation and operation of the Proposed Action would not be expected to generate substantial air emissions.

### **Cumulative Impacts**

Given the limited amount of construction and operational emissions and lack of surrounding communities, no cumulative impacts would be expected.

## **4.2.2 AIRSPACE**

This section addresses potential impacts to airspace due to the proposed construction and operation of GMD facilities on Eareckson AS.

Under the Proposed Action, there are no requirements for any restricted airspace as a result of the Proposed Action; therefore, there would be no impact to this resource area and it is not analyzed further. Proposed hardware and software upgrades to the COBRA DANE radar would not change the power input or output. During GMD test operations and training, radiated peaks and average power and operating bounds would remain the same as current levels.

### 4.2.3 BIOLOGICAL RESOURCES

This section addresses potential impacts to biological resources including vegetation, wildlife, threatened and endangered species, and environmentally sensitive habitat due to the proposed construction and operation of GMD facilities on Eareckson AS. Ground disturbance, habitat loss, noise from construction, and an increase in personnel during construction and operation of the Proposed Action at Eareckson AS could result in impacts to biological resources present in the area.

#### Construction

##### *Vegetation*

Ground disturbance during construction would result in removal of vegetation and wildlife habitat within the proposed sites. This would only represent a small amount of total available vegetation and should not result in adverse impacts except for the loss of crowberry plants, an important fall food for Aleutian Canada geese.

##### *Wildlife*

Impacts to wildlife could occur during the construction of the proposed facilities. Construction ground disturbance and equipment noise-related impacts could include loss of habitat, displacement of wildlife, increased stress, and disruption of daily/seasonal behavior. Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, additional similar habitat is adjacent to the area proposed for use. Although construction activities could cause flushing (causing birds to suddenly fly up), this is a common reaction to sudden natural sounds and only slightly increases the energy expenditure of individual birds. Wildlife has become accustomed to the current noise and human presence. Given the small area of disturbance and short-duration of the construction period (18 months) it is not anticipated that any adverse impacts would occur.

The movement of equipment and materials to Shemya Island during construction and operation of the Proposed Action would increase the probability of introducing invasive species to the island. Measures would be taken to prevent the introduction of Norway rats, other rodents, or invasive plants.

##### *Threatened and Endangered Species*

General construction activities would occur inland and would result in no impacts to threatened and endangered marine mammals. As discussed in the NMD Deployment EIS, barge activities would be limited to a few times a year, would not occur next to Steller seal lion haul out areas, and are not anticipated to adversely affect sensitive species. Shemya Island is not a nesting area for the Aleutian Canada goose, nor a breeding or pupping area for the Steller sea lion. If it is determined that a mancamp is required on Eareckson AS, a site would be selected that would avoid damage to crowberry, the main food source for the Aleutian goose in the fall, to the extent practicable. Loss of this food may cause geese

to shift their feeding distribution closer to the runway and increase the hazard to aircraft. The presence of the short-tailed albatross on Shemya Island is considered unlikely. It is also highly unlikely that the spectacled eider would be present offshore.

#### *Environmentally Sensitive Habitat*

Since almost all of Shemya contains wetlands, impacts are unavoidable, but wetlands would be avoided to the extent practicable in accordance with Executive Order 11990, *Protection of Wetlands*. The Executive Order requires that action be taken to minimize the destruction, loss, or degradation of wetlands and that all practicable measures to minimize harm to wetlands are included in the Proposed Action if there is no practicable alternative to construction in wetlands areas. Approximately 5 hectares (12 acres) of wetlands would be disturbed by the GMD VOC proposed construction activities (less than that proposed for disturbance in the NMD Deployment EIS). An additional 2 hectares (5 acres) of wetlands could be filled if the large quantities of peat that would be removed during construction require disposal. Less than 1 percent of the wetlands on the island would be affected.

Minimizing disturbance to wetlands would include Best Management Practices such as controlling runoff from construction and operation sites into adjacent wetlands through stabilizing fill slopes from erosion and the use of berms, silt curtains, straw bales, and other appropriate techniques to filter sediment from storm water runoff. Equipment should be washed in areas where wastewater can be contained and treated or evaporated. Permits under Section 404 of the Clean Water Act and state Section 401 water quality certification would be obtained where wetlands would be affected and before any discharge of fill material. The Alaska water quality certification would require that any discharge to navigable waters comply with applicable provisions of the Clean Water Act, including water quality standards. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations through the public and agency review process.

Mitigation measures would be developed during the Section 404 permitting process with the U.S. Army Corps of Engineers. Agency-recommended mitigations would take into account the size and quality of the wetlands involved. The following measures to mitigate or minimize impacts to wetlands were proposed in the NMD Deployment EIS.

- avoidance of direct and indirect disturbance of wetlands through facility redesign
- on-base (if possible) replacement of wetlands
- restoration/enhancement of wetland habitat
- monitoring (until habitat becomes well established) of any replacement wetlands as required to determine the effectiveness of replacement and any remedial measures.

Because the creation or development of wetlands represents a substantial financial investment, and the process may take several years to complete, this option is often reserved for wetland mitigation of high quality or for sizable area of affected wetlands. The probability of success that a newly created wetland would survive and flourish could vary, which sometimes makes this option less desirable than wetland restoration or avoidance.

The USFWS indicated during NMD Deployment EIS consultation that there is no appropriate area on Shemya to mitigate potential impacts to wetlands by replacement. Therefore, they suggested implementing mitigation measures on other Aleutian islands such as reintroducing the Evermann's Rock Ptarmigan to Agattu from Attu and studying the population and distribution of Cormorants in the Near Islands.

## **Operations**

### *Vegetation*

The climate and type of vegetative cover that grows on the island coupled with any disturbance in the area automatically limits the growth of the vegetation and no mowing is required. No operational impacts to vegetation are anticipated.

### *Wildlife*

No adverse impacts to wildlife from operation of the COBRA DANE radar have been identified. Most operational impacts to wildlife from the Proposed Action would come from security lighting and from periodic noise from the electrical generators required for some sites. The lighting and noise could encourage species less tolerant of these types of disturbances to avoid the area. Generator noise levels expected at the site could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities for backup generators. The two 9.1-meter (30-foot) poles associated with the IDTs would not be supported by guy wires and do not represent a potential hazard to migratory birds. The U.S. Air Force and the USFWS are conducting vegetation studies to assist in a bird aircraft strike hazard assessment. This assessment would contain guidelines to minimize the potential safety hazard to aircraft from a bird strike during flight operations from Eareckson AS. It is not anticipated that there would be a substantial change in aircraft traffic as a result of GMD operations. The USFWS allows the U.S. Air Force to maintain vegetation on the island to minimize use by the recently delisted Aleutian Canada goose.

During normal GMD operations the IDT and DSCS would not transmit except for a few minutes during tests of the equipment. Given the short duration of transmission, no adverse impacts to wildlife are anticipated from operations.

### *Threatened and Endangered Species*

Operational activities would mainly occur inland and would result in no impacts to threatened and endangered marine mammals. As mentioned above, barge activities would be limited to a few times a year and would not occur next to Steller seal lion haul out areas. The IDT and DSCS would only transmit for short periods during tests of the equipment. No adverse impacts to threatened and endangered species from operation of the COBRA DANE radar have been identified.

### *Environmentally Sensitive Habitat*

No impacts to environmentally sensitive habitat due to operational activities are anticipated.

## **Cumulative Impacts**

Cumulative impacts would result from increased activity during construction and the loss of a small amount of habitat at the proposed site. Shemya Island is not considered critical habitat. The loss of habitat and wetlands (less than one percent of total wetlands on the island) would result in cumulative impacts to biological resources on the island given past development; however, since most of the island has been developed and previously disturbed the cumulative impacts would be minor. No major future programs have been identified at Eareckson AS or the region that could contribute to cumulative impacts to biological resources.

## **4.2.4 CULTURAL RESOURCES**

The following section discusses the potential for impacts to historic resources due to construction and operation of the Proposed Action.

### **Construction**

#### *Prehistoric and Historic Archaeological Resources*

No impacts are anticipated to any known prehistoric and historic archaeological sites on Eareckson AS. Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. If during construction of any GMD component cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

#### *Historic Buildings and Structures*

The only known historic structure on Eareckson AS is the COBRA DANE radar and only interior modifications are proposed resulting in no impacts to its historic integrity. Since the COBRA DANE facility is eligible for listing on the National Register of Historic Places, consultation with the Alaska SHPO has been initiated. HABS/HAER documentation and guidelines resulting from this consultation would be implemented.

#### *Native Populations/Traditional Resources*

During the siting process for the Proposed Action the three prehistoric archaeological sites eligible for conveyance to the Aleut Corporation under section 14(h) (1) of the Alaska Native Claims Settlement Act were avoided, and no impacts are anticipated.

#### *Paleontological Resources*

No paleontological resources have been recorded on Shemya Island, however, if fossils are unexpectedly discovered, subsequent actions may be required.

## **Operation**

Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. No impacts to cultural resources are anticipated during operation of the Proposed Action at Eareckson AS. However, if during operation at any GMD component cultural items are inadvertently discovered, activities would cease in the immediate area and the Alaska SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow the guidance provided.

## **Cumulative Impacts**

Potential cumulative impacts on historic properties would be minimized through avoidance or through mitigation measures that would be developed in consultation with the Alaska SHPO.

### **4.2.5 GEOLOGY AND SOILS**

This section addresses the potential impacts to geology and soils due to construction and operation of the IDT and DSCS, mancamp, beach landing area, and support facilities of the GBI VOC test site.

## **Construction**

Construction would require grubbing and grading for site preparation. Proposed facility sites on Shemya Island generally have terrain and geologic settings favorable for construction and controlling soil erosion, however, geotechnical studies may be required to ensure suitable foundation design in selected areas. The primary soil management issues would most likely be limited to soil erosion from short-term construction activities. BMPs would be implemented to minimize negative short-term effects of clearing and grading activities during site preparation, as well as excavations and grading for connecting infrastructure, roadways and parking.

Eareckson AS is located within seismic zone 4 and would be subject to a high probability of severe ground shaking during the design life of the proposed facilities. Construction of the Proposed Action would incorporate seismic design parameters consistent with the critical nature of the facility and its geologic setting.

## **Operation**

Once construction is complete and vegetation is replaced, there should be little potential for soil erosion from operations, and no impacts to geology and soils are anticipated.

## **Cumulative Impacts**

Given the limited amount of ground disturbance associated with the Proposed Action, no cumulative impacts to geology and soils are anticipated.

#### 4.2.6 HAZARDOUS MATERIALS AND WASTE

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with construction and operation of the proposed IDT; DSCS; software and hardware upgrades to the existing COBRA DANE radar, installation of FOC, refurbishment of the existing power plant, and mancamp, including the potential impacts on the ongoing remediation activities at existing contaminated sites.

Proposed construction and operation would require the use of new facilities. Interior building modifications to the COBRA DANE radar facility would be required as part of the Proposed Action. Upgrades to the existing power plant involve only the refurbishment or replacement of mechanical equipment with no building modifications anticipated.

##### Construction

###### *Hazardous Materials and Waste Management*

Hazardous wastes generated during construction would consist of materials such as waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. These materials would be containerized and properly disposed of by the individual contractors. Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's SWPPP and Project Spill Prevention, Control, and Countermeasure Plan that would be developed for each site. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable Federal, state, and local regulations.

Construction activities would be centralized to the greatest extent possible and would occur at the proposed sites on specified construction laydown areas and access roads. Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans.

###### *Asbestos*

Unencapsulated asbestos was determined to be present in an unused area of Building 600. Asbestos is likely to be present in other buildings that could be used as part of the Proposed Action. It is reported to be encapsulated and in good condition. Since only maintenance and/or repairs, rather than modification, are scheduled for these buildings that may contain asbestos, there would not be any impact from asbestos.

###### *Lead-based Paint*

Based upon the number of buildings constructed prior to 1978, the presence of lead-based paint is likely in buildings that are associated with the Proposed Action. Since only maintenance and/or repairs, rather than modifications, are scheduled for these buildings that may contain lead-based paint, there would not be any impact from lead-based paint.



**DEPARTMENT OF DEFENSE  
MISSILE DEFENSE AGENCY  
7100 DEFENSE PENTAGON  
WASHINGTON, DC 20301-7100**

GMS-E

March 15, 2002

**SUBJECT: Ground-based Midcourse Defense (GMD) Validation of Operational Concept (VOC)  
Environmental Assessment (EA)**

**TO WHOM IT MAY CONCERN:**

Provided for your review and your use is the GMD VOC EA and associated Draft Finding of No Significant Impact (FNSI). This office should receive comments on these documents no later than April 13, 2002. Interested parties can also review the Draft FNSI and the EA on the Internet at [www.acq.osd.mil/bmdo/bmdolink/html/newrel.html#envir.ANC](http://www.acq.osd.mil/bmdo/bmdolink/html/newrel.html#envir.ANC).

Questions and comments regarding these documents or requests for additional copies should be addressed to:

U.S. Army Space and Missile Defense Command  
ATTN: Mr. David Hasley, SMDC-EN-V  
P.O. Box 1500  
Huntsville, AL 35807-3801

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Davis", is written over the typed name.

STEVE DAVIS  
Colonel, U.S. Army  
Director, Site Activation  
Ground-Based Midcourse Defense

# DRAFT

## DEPARTMENT OF DEFENSE Missile Defense Agency

### Ground-Based Midcourse Defense (GMD) Validation Of Operational Concept (VOC) Environmental Assessment

**AGENCY:** Missile Defense Agency

**ACTION:** Finding of No Significant Impact

**BACKGROUND:** Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations 1500-1508), Department of Defense (DoD) Instruction 4715.9, Army Regulation 200-2 and Air Force Instruction 32-7061, which implement these regulations, an Environmental Assessment (EA) to analyze the environmental consequences of the GMD VOC has been completed. The EA is incorporated by reference in this Finding of No Significant Impact (FNSI), and is also summarized below.

Within the DoD, the Missile Defense Agency (MDA) (formerly known as the Ballistic Missile Defense Organization) is responsible for developing, testing, and preparing to deploy a ballistic missile defense system (BMDS). There are three BMDS Segments currently under development, Boost Defense, Midcourse Defense, and Terminal Defense. One element of the Midcourse Defense Segment is Ground-based Midcourse Defense (GMD) (formerly known as National Missile Defense [NMD]), which is designed to intercept long-range ballistic missiles during the midcourse (ballistic) phase of their flight, before their reentry into the earth's atmosphere.

The NMD Deployment EIS analyzed the proposed deployment of the NMD to defend against limited strategic ballistic missile threats to the United States. GMD is the successor missile defense element to NMD, and it consists of the same architecture as did NMD. The GMD architecture consists of five components: Battle Management, Command, Control, and Communications (BMC3), which includes the Battle Management, Command and Control (BMC2), the GMD communication network (GCN) (formerly called National Missile Defense Communication Network, and the In-Flight Interceptor Communication System Data Terminal (IDT); Ground-Based Interceptor (GBI); X-Band Radar (XBR); Upgraded Early Warning Radar (UEWR); and space-based sensors.

The purpose of the GMD is to defend the entire United States against limited ballistic missile attack. However, there has been no decision to deploy the GMD. Following a series of reviews, the MDA re-focused the GMD from near term deployment to an effort to provide operationally realistic testing. Validating the operational concept through ground based testing of the GMD is a vital part of operationally realistic testing. The EA analyzes potential GMD VOC test sites in Alaska that were identified in the 2000 NMD Deployment Environmental Impact Statement (EIS) and which remain reasonable

# DRAFT

alternatives for providing a limited ballistic missile defense for the entire United States and related actions in sites outside Alaska.

**DESCRIPTION OF THE PROPOSED ACTION:** This EA evaluates activities designed to validate the GMD operational concept, including construction techniques, operational procedures, installation, checkout, assembly, and maintenance. These activities would enable MDA to assess the performance of the existing and planned BMC3 network and provide vital validation of the operational concept through distributed integrated ground tests using GMD components located in operationally representative locations and environments. This validation of the operational concept has utility and importance to MDA independent of the more robust integrated flight testing of GMD components, also in the planning stage.

Many of the locations for the infrastructure and facilities proposed for use in testing the GMD operational concept were analyzed in the NMD Deployment EIS and are, in general, smaller scale, or closely related versions of actions at locations identified in the EIS. Validation of the GMD concept through operationally realistic testing of selected components is integral to accomplishing future deployment of the GMD. Consequently, the GMD VOC EA incorporates by reference much of the analysis in the NMD Deployment EIS. Those activities not addressed in the EIS, or that are significantly different from those analyzed in the EIS, are analyzed in detail in the GMD VOC EA. The current timetable is for construction of test facilities to begin in the Spring of 2002, with testing of the operational concept to begin no earlier than the Fall of 2004.

The proposed action includes construction and test activities at the following locations:

Fort Greely – construction and operational testing of six GBI silos and supporting facilities, one IDT, and one Defense Satellite Communication System (DSCS) earth terminal and a BMC2 execution node. Activities at Fort Greely would also include installation of fiber optic cable, electrical distribution system upgrades, upgrades to the Allen Army Airfield, establishment of a construction debris landfill and extension of the existing solid waste landfill at the GMD VOC test site, and establishment of mancamp(s) for construction workers.

Eareckson Air Station (AS) Alaska – construction and testing of one IDT and DSCS earth terminals, upgrades to hardware and software and interior modifications at the existing COBRA DANE Radar, installation of terrestrial fiber optic cable, refurbishment of the existing Air Force power plant including addition of one previously designed 9.5 million liter (2.5 million gallon) fuel tank, modifications to existing administrative and support facilities, and establishment of mancamps if interior modification to existing facilities are not adequate to house the number of personnel involved in the construction project.

Eielson Air Force Base (AFB), Alaska – construction and operation of a missile transfer facility and construction of an emergency pull-off ramp on the Richardson Highway.

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Beale AFB, California – upgrade the hardware and software to the Early Warning Radar as analyzed in the NMD Deployment EIS and incorporated by reference in the GMD VOC EA, and perform interior building modifications to accommodate the upgrades.

Installation of equipment and use of existing communications and facilities at one or more of Peterson AFB, Cheyenne Mountain Complex and Shriever AFB in Colorado, Eareckson AS, Alaska, Beale AFB California, and contractor facilities in Alabama and California.

**ALTERNATIVES CONSIDERED:** Clear Air Force Station (AFS), Alaska is being considered as an alternative location to Fort Greely for the six GBI silos and support facilities and associated BMC3 including one IDT, one Defense Satellite Communication System (DSCS) earth terminal, a BMC2 execution node and installation of terrestrial fiber optic cable.

The no-action alternative was also considered. Under the no-action alternative, MDA would not proceed with construction and testing to support validation of the GMD operational concept through ground-based testing. Selection of the no-action alternative would not allow this vital part of operationally realistic testing needed to further develop the GMD element of the Midcourse Defense Segment.

**ENVIRONMENTAL EFFECTS:** Thirteen broad environmental resource areas were considered to provide a context for understanding the potential effects of the proposed action and to provide a basis for assessing the severity of potential impacts. These resource areas included air quality, airspace, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise, socioeconomic, and water resources. They were analyzed as applicable for each proposed location or activity. Implementation of the proposed action at Fort Greely or at the GBI VOC test site alternative at Clear AFS could indirectly affect nearby wetlands. Impacts to wetlands will be avoided where possible by using erosion and storm-water runoff control and obtaining required permits. The positive economic benefit of the construction and test activities would help offset job losses and economic impacts from the realignment of Fort Greely. The electrical transmission upgrade would benefit the surrounding area. Implementation of the proposed action would result in only minor impacts to all other resource areas considered.

Under the no-action alternative, no environmental consequences associated with GMD VOC activities would occur.

**CONCLUSION:** Based on the environmental analysis in the GMD VOC EA, MDA has determined that no significant impacts would occur as a result of the construction and operation of any of the GMD VOC test sites and related support facilities. Preparation of an EIS, therefore, is not required.

# **DRAFT**

**DEADLINE FOR RECEIPT OF WRITTEN COMMENTS: April 13, 2002**

**POINT OF CONTACT:** Submit written comments or requests for a copy of the EA to:  
U.S. Army Space and Missile Defense Command  
Attention: SMDC-EN-V (David Hasley)  
Post Office Box 1500  
Huntsville, Alabama 35807-3801

## *PCBs*

Eareckson AS is considered PCB free, and no impact would be expected.

## **Operations**

### *Hazardous Materials Management*

The maintenance and operation activities of the Proposed Action would be minimal. The expected hazardous materials include lubricants and oils, electrical generator fuels, and backup power batteries. These materials would be controlled and managed through an existing hazardous materials program. These materials would be used in the periodic inspection and preventative maintenance associated with the backup generator system. Besides the fuel for the electrical generator, no hazardous materials would be stored onsite. Any location where hazardous materials are used will have appropriate Material Safety Data Sheets posted. The appropriate spill response and hazardous materials management plan would be developed for the Proposed Action in accordance with Federal, state, and local regulations. Eareckson AS also has an existing SWPPP and an Oil and Hazardous Substance Discharge Prevention and Contingency Plan that would be updated to reflect these materials.

### *Hazardous Waste Management*

As discussed above, there would be minimal use of hazardous materials during operation of the Proposed Action. This would not affect Eareckson AS's status as a small quantity generator as defined by the EPA. Most hazardous waste generated would be used oil from the occasional maintenance of the electrical generators at the site. The used oils would be recycled in accordance with appropriate regulations by the host installation. Any hazardous waste generated at the site would be removed after maintenance and transferred to the host installation's main hazardous waste storage facility. Used batteries would be recycled through the Defense Reutilization and Marketing Office. Any hazardous waste generated would be handled in accordance with appropriate Federal, state, and local regulations. The appropriate hazardous waste management plan would be developed for the site.

### *Pollution Prevention*

A stated objective of the GMD element is to seek opportunities to eliminate or minimize use of hazardous materials throughout the life cycle of the program. A Pollution Prevention Plan would outline strategies to minimize the use of hazardous materials. This plan would be applied throughout the design of all related facilities, incorporating trade studies and emphasizing reduction of hazardous materials to be used on government installations. It is currently being developed as part of the GMD element. The majority of the waste stream from GBI VOC test site operations would be recycled or utilized for energy recovery.

### *Installation Restoration Program*

Operation would be designed to avoid interference with potential ongoing remedial activities and would be coordinated with appropriate Federal and state regulatory officials. A portion of the proposed concrete batch plants (north and south) and the concrete tip site

for the DSCS lie within the previously existing Installation Restoration Program Site ST10. The source of the contamination was from a release from three USTs located at the Vehicle Fueling Shop. Contaminated debris and soil were removed in 1992 and 1993 and biannual groundwater monitoring is being conducted.

#### *Radon*

In areas where existing radon surveys have been found to exceed U.S. EPA recommendations, appropriate design techniques would be utilized for occupied facilities to ensure exposure levels would not exceed recommended levels.

#### *Pesticides*

During the IDT, DSCS, and mancamp operational maintenance, pesticides may be needed within the site. The use of pesticides would be in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act. Local installation personnel would be contacted for appropriate materials that should be used for Eareckson AS.

#### **Cumulative Impacts**

Potential cumulative hazardous materials and hazardous waste impacts could occur with the combination of the Proposed Action activities and ongoing and future hazardous materials and hazardous waste management activities. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues given the small amounts of these materials used and generated.

### **4.2.7 HEALTH AND SAFETY**

This section addresses the potential impacts to health and safety due to construction and operation of the proposed IDT, DSCS, mancamp, staging area, and support facilities of the GBI VOC test site on Eareckson AS.

IDT health and safety impacts are evaluated by determining the processes that have the greatest potential for damage or injury. The primary health and safety issue associated with the IDT operation is EMR health impacts to the workers. Possible EMR impacts could include worker exposure that exceeds standards, ignition of explosive devices, and effects to critical communication systems.

The potential for EMR exposure and general construction-related health and safety issues is common to any BMC3 location. Therefore, these potential health and safety issues are addressed below. Potential impacts related to construction worker exposure to asbestos, lead-based paint, and ground/water site contamination are addressed under Hazardous Materials and Hazardous Waste Management.

#### **Construction**

The construction of the Proposed Action components would be conducted in accordance with the U.S. Army Corps of Engineers *Safety and Health Requirements Manual* and OSHA

regulations. The construction of new facilities is routinely accomplished for both military and civilian operations and presents only occupational-related effects on the safety and health of workers involved in the performance of construction activity.

## **Operations**

### *EMR*

During normal operating scenarios, the IDT and DSCS would not transmit except during periodic testing of the equipment. It is expected that a power/calibration test of the transmitter would occur at least once a year. During this test EMR would be generated by the IDT, but EMR levels would not exceed established personnel exposure limits. No impacts to health and safety are anticipated from operation of the IDT or DSCS sub-components. The remainder of the year, the IDT and DSCS would not generate any EMR. No health and safety impacts associated with other proposed activities (COBRA DANE radar) operation of the existing power plant, and mancamp/administrative support facilities are expected.

## **Cumulative Impacts**

There are no health and safety risks associated with operation of the Proposed Action; therefore, no cumulative impacts should occur.

## **4.2.8 INFRASTRUCTURE**

This section addresses the potential for impacts to infrastructure due to the proposed construction and operation of the Proposed Action.

The Proposed Action would increase employment by a minimum of 35 personnel up to a maximum of 200 personnel. The base infrastructure was designed to accommodate 1,500 personnel. Currently, approximately 80-100 personnel reside on base at any one time.

## **Construction**

### *Water*

During construction, it is expected that water demand would increase as a result of construction workers taking up temporary residence. The existing potable water system at Eareckson AS is anticipated to have sufficient available capacity for construction personnel and activities. Other on-base water usage from construction would be related to site watering and any required batch plants. The available capacity of 1.28 million liters (0.33 million gallons) per day would be sufficient to handle this demand.

### *Wastewater*

An increase in wastewater usage would occur during construction of the proposed facilities. During construction, it is expected that wastewater would increase on base as a result of construction workers taking up temporary residence. The increase in wastewater

usage would be well within the available capacity of 0.69 million liters (0.18 million gallons) per day.

#### *Solid Waste*

Solid wastes associated with the preferred alternative are expected to be shipped offsite. Current estimates anticipate the landfill to reach capacity in less than 15 years. However, there is space available to expand the landfill if necessary.

#### *Electricity*

Eareckson AS obtains its power from an on-base Power Plant, which is able to provide sufficient power to the installation. It is anticipated that a 9.5-million-liter (2.5-million-gallon) fuel tank would be installed and connection made into the existing piping system. No increase in electricity producing capacity of the power plant is anticipated.

#### *Mancamp*

Lighting would be installed for security and parking at the mancamp location. All utility services would be provided by the Power Plant, and would be brought to the site with minimum connectivity and there would be no impact to the existing system. Eareckson AS would provide electricity, with backup power provided by temporary generators as needed. Minor heating, electrical, and plumbing system repairs would be performed as necessary in the additional support buildings provided for warehouse and equipment maintenance space.

Although the requirement for the mancamp has not been validated, the preferred location is close to supplies of electricity, water and sewer service.

### **Operation**

#### *Water*

Water usage would be expected to increase, based on the increase in operational personnel, which is within the available base capacity.

#### *Wastewater*

Wastewater generation would be expected to increase, based on the increase in personnel for operation. It is anticipated that the available base capacity is sufficient to accommodate the potential increase in wastewater.

#### *Solid Waste*

It is anticipated that available landfill capacity is sufficient to accommodate the potential increased generation of solid waste.

### *Electricity*

Currently, the U.S. Air Force is overhauling five of the six existing diesel generators. However, no increase in electricity producing capacity is anticipated as a result of the Proposed Action.

### *Mancamp*

All utility services would be provided by the Government, and would be brought to the site with minimum connectivity and there would be no impact to the existing electrical system. Eareckson AS would provide electricity, with backup power provided by generators as needed.

### **Cumulative Impacts**

The construction programs, which consist mostly of new construction and minor upgrades to existing infrastructure, could result in a temporary increase in utility demands, which would be accommodated through existing or temporary construction-related utility systems. It is not expected that GMD VOC activities would exceed any of the operational capabilities of the existing infrastructure system.

## **4.2.9 LAND USE**

This section addresses potential environmental impacts caused by changes to the land use environment due to the construction and operation of the Proposed Action. These impacts include potential effects from ongoing projects and activities at these sites.

### **Construction**

Currently the station has no zoning or land use conflicts. Eareckson AS is under the primary jurisdiction of the U.S. Air Force and is surrounded by the Alaska Maritime National Wildlife Refuge. The Proposed Action would coincide with the existing mission of the station, which is to monitor and track space and missile activity.

Construction activities would be consistent to the maximum extent practicable with coastal management policies.

### **Operation**

Operation of the proposed GBI VOC test site components would not interfere with current Eareckson AS activities.

### **Cumulative Impacts**

No cumulative impacts to land use are anticipated.

#### **4.2.10 NOISE**

This section addresses the potential impacts to the noise environment due to the construction and operation of the Proposed Action.

##### **Construction**

Construction activity would not cause a significant noise impact since it would be short-term, and would not constitute a health risk. No sensitive land uses such as residences, schools, or hospitals are located on Shemya.

##### **Operations**

Operational noise from the IDT and DSCS terminal would result from intermittent operation of a backup generator during testing which would occur for 2 hours each week and during commercial power outages.

##### **Cumulative Impacts**

Short-term cumulative impacts could result if construction activities occurred concurrently with other construction activities nearby. In addition, long-term noise impacts could occur if the operational noise from the site combined with other existing noise sources to increase levels above recommended exposure levels for certain land uses. However, given the intermittent nature of operational noise, cumulative impacts are not likely.

#### **4.2.11 WATER RESOURCES**

This section addresses the potential impacts to water resources due to construction and operation of the IDT and DSCS, mancamp, beach landing area, and support facilities of the GBI VOC test site.

##### **Construction**

Construction activities would require grubbing and grading for site preparation. The proposed sites are located on relatively level topography, where drainage patterns would only be altered slightly and surface water runoff and erosion would be minimal during the short duration of construction until surface vegetation is re-established. A minor increase of sediment in surface waters is possible, but not likely. The proposed site would be located to avoid poorly drained areas.

The Proposed Action would be subject to Federal NPDES permitting requirements. The water requirements for construction work and water for the construction workforce would be less than the 9,400 liters (2,483 gallons) per day analyzed in the NMD Deployment EIS. The withdrawal of this amount of water would not be expected to impact most water supply aquifers and surface water sources.

Shemya Island is a high seismic setting. Provisions would be made to design new fuel storage structures, piping, and AST's to minimize the potential effects of severe ground shaking and tsunami wave run-up. Fuel transfer and distribution procedures and spill mitigation would be addressed in the spill prevention, control, countermeasures, and emergency response procedures.

#### **Cumulative Impacts**

Future programs and previous activities at the site would not be expected to combine to create any cumulative water resources impacts.

### **4.2.12 ENVIRONMENTAL JUSTICE**

This section addresses the potential environmental justice impacts due to construction and operation of the proposed action.

#### **Construction and Operation**

Eareckson AS is on Shemya Island, and only military personnel and contractors live at this site. There are no disproportionately high minority or low-income populations around Eareckson AS. The nearest population center to Eareckson AS is Adak Station on Adak Island, which is approximately 587 kilometers (365 miles) to the east of Eareckson AS. As of 1999, 80 percent of the population within the Aleutians West Census Area reside in the City of Unalaska, which is located on Unalaska Island approximately 1,231 kilometers (765 miles) to the east of Eareckson AS.

#### **Cumulative Impacts**

No other projects or activities in the region have been identified that would contribute to potential cumulative environmental justice impacts.

### **4.3 EIELSON AFB, ALASKA**

As discussed in chapter 2, Eielson AFB would be the location of a Missile Transfer Facility. Proposed activities at Eielson AFB include construction and operation of the Missile Transfer Facility including the installation of lighting fixtures and a security fence, minor modification of existing onbase access roads, and multiple pull-offs along public highways between Eielson AFB and the selected GBI VOC test site. The Missile Transfer Facility would support cold weather loading/off loading and storage requirements of the interceptor and support equipment.

Resources that have a potential for impacts were considered in the analysis to provide the decision makers with sufficient analysis for evaluation of potential effects of the action.

#### **4.3.1 AIR QUALITY**

This section addresses the potential impacts to air quality due to construction and operation of a Missile Transfer Facility on Eielson AFB.

##### **Construction**

Location of the Missile Transfer Facility would require widening and paving access roads to the site, establishment of new utility corridors, installation of a backup generator, and fuel storage facilities. The proposed construction would cause temporary localized increases in air emissions.

Construction would be conducted in accordance with applicable regulations and permits and would occur on a leveled and graveled site. Although the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state standards beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

##### **Operation**

Existing on base resources would provide power for the Missile Transfer Facility. A backup generator would be maintained in the event of a power outage and would require appropriate operating permits.

Eielson AFB is a major source of air pollutants and a major source of Hazardous Air Pollutants and maintains a Title V Air Permit limiting the emission of pollutants. Under normal operations, the Missile Transfer Facility would generate minimal emissions, the majority of which would come from the operation of the backup generator, which would be appropriately permitted.

No air quality impacts would be anticipated due to the normal operational emissions of the proposed Missile Transfer Facility. Eielson AFB is not within 10 kilometers (6 miles) of a Class I area, and no PSD review would be required based on proximity to a Class I area. The proposed operation would not be expected to impact any Class I area.

Operation of the Missile Transfer Facility at Eielson AFB would not be anticipated to cause or contribute to exceedances of the NAAQS or state standards and as such would not be expected to cause any change in the area's attainment status.

##### **Cumulative Impacts**

It is anticipated that construction and operation of the Missile Transfer Facility on Eielson AFB when combined with existing and reasonably foreseeable operations on the base would not result in cumulative air quality impacts.

### 4.3.2 BIOLOGICAL RESOURCES

This section addresses the potential impacts to biological resources due to the construction and operation of a Missile Transfer Facility on Eielson AFB.

#### Construction

##### *Vegetation*

The proposed Missile Transfer Facility would be located on a previously disturbed graveled area in proximity to the airfield. Modifications to access roads are expected to be within existing rights-of-way. No sensitive vegetation has been identified within the site, and no impacts to vegetation are anticipated.

##### *Wildlife*

No anadromous fish streams are near the proposed site. Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, additional similar habitat is adjacent to the area proposed for the Missile Transfer Facility. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence. The presence of personnel may cause wildlife to temporarily avoid the area.

##### *Threatened and Endangered Species*

No Federal or state listed threatened or endangered species have been observed at Eielson AFB. However, the recently delisted peregrine falcon may travel through the area, and therefore could potentially be disturbed by construction-related noise. This unlikely disturbance would be short-term and is not expected to disrupt nesting or alter migration patterns.

##### *Environmentally Sensitive Habitat*

Construction activities would occur on a previously disturbed graveled site adjacent to wetlands areas. BMPs such as stabilizing fill slopes to minimize erosion and the use of hay bales to filter sediment from storm water runoff would be implemented. Any discharge or runoff would comply with applicable provisions of the Clean Water Act, including water quality standards. Maintenance of wetland quality and value would be coordinated with applicable agencies. No impacts to the adjacent wetlands are anticipated.

#### Operation

##### *Vegetation*

No impacts to vegetation are anticipated during operation of the Missile Transfer Facility.

### *Wildlife*

The infrequency of flights required to transport GBI components if Eielson AFB is used as a Missile Transfer Facility location is not expected to change policies and procedures regarding wildlife management including planning to avoid bird strikes by aircraft. Personnel would only be present at the Missile Transfer Facility when a GBI arrives on base and is being prepared for transportation to the GBI field or temporary storage. Security lighting could potentially attract wildlife to the project areas; however, any impacts, such as startling when personnel are in the area, would be minimal. Otherwise the facility would be unmanned except for occasional maintenance activities such as landscaping. Only minor, short-term impacts to wildlife, such as startling, are anticipated as a result of these activities.

### *Threatened and Endangered Species*

No impacts to threatened or endangered species are anticipated during operation of the Missile Transfer Facility.

### *Environmentally Sensitive Habitat*

No impacts to sensitive habitat are anticipated during operation of the Missile Transfer Facility.

### **Cumulative Impacts**

No cumulative impacts to biological resources are anticipated.

## **4.3.3 GEOLOGY AND SOILS**

This section addresses the potential impacts to geology and soils due to the construction and operation of the Missile Transfer Facility.

### **Construction**

The Missile Transfer Facility would be constructed on a relatively flat parcel previously used for a storage pad/gravel parking area. The potential for soil erosion is minimal, however, BMPs would be employed during construction to further mitigate the deleterious effects of grading and excavations. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes.

Eielson AFB is within a region of discontinuous permafrost. Geotechnical studies would be performed to evaluate permafrost conditions at the site to enhance foundation design.

Construction on Eielson AFB would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process; however, this should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract.

## **Operations**

Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site. The Missile Transfer Facility would be designed to minimize the possible effects of high seismic ground accelerations.

## **Cumulative Impacts**

No cumulative impacts are anticipated resulting from new construction planned for the cantonment area at Eielson AFB. No long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts are expected from construction and operation at this location.

### **4.3.4 HEALTH AND SAFETY**

This section addresses the potential impacts to health and safety due to the construction and operation of the Missile Transfer Facility on Eielson AFB.

#### **Construction**

Construction of the Missile Transfer Facility would not conflict with any existing safety risks on Eielson AFB.

#### **Operation**

The Missile Transfer Facility would require the establishment of a ESQD. The establishment of the ESQD would go through DoD review to ensure there are no incompatible health and safety issues. The proposed ESQD associated with the Missile Transfer Facility would fall within the base boundary; therefore, an explosion of the GBI within the facilities should not pose a public health and safety risk.

During operation, the Missile Transfer Facility would be dormant except for the occasional transfer activities. Eielson AFB would provide some logistical support such as fire response and use of the airfield. The Eielson Fire Department is adequate to handle the installation and operation of the Missile Transfer Facility and provide fire-fighting support. None of the U.S. Army or U.S. Air Force training exercises would conflict with the operation of the Missile Transfer Facility or present an incompatible health and safety issue. The potential for an aircraft mishap to occur over the Missile Transfer Facility is considered remote. The main U.S. Air Force impact areas and training areas are east of the proposed site and would not be affected.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. At no time would it be expected that peak hydrogen chloride (the toxic constituent of main concern of burning solid propellants) emission levels would exceed public exposure guidelines.

The potential for a liquid propellant leak is remote; however, if a liquid propellant leak were to occur, there is the potential for health hazard from the gases. The hazardous extent of the cloud could exceed the OSHA Permissible Exposure Level up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. The hazardous emission from the Missile Transfer Facility site would not affect any areas outside of the base boundary and would not include the administrative areas on Eielson AFB; therefore, there would be minimal public health and safety risk.

To reduce the potential for forest fires affecting the proposed Missile Transfer Facility site, the fire protection status would need to be changed from Full Protection to Critical Protection. The Critical Protection status would give the site the highest level of fire fighting protection provided by the Bureau of Land Management Alaska Fire Service. The U.S. Army would need to coordinate this revision with the Alaska Fire Service. Cooperative agreements with ten local fire departments and the Bureau of Land Management would need to be updated to inform them of the additional hazards and safety considerations of GBI temporary storage and transportation.

For the Missile Transfer Facility site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

The main health and safety risks at Eielson AFB would be associated with GBI transportation from the base to the GBI VOC test site. As addressed previously in section 4.1.6, the potential for a mishap during transportation of the GBI is considered remote; therefore, there would be minimal increase in health and safety risk at Eielson AFB.

### **Cumulative Impacts**

Potential cumulative health and safety impacts are not expected to occur at Eielson AFB with the combination of Missile Transfer Facility activities and ongoing health and safety risk from current military activities. No new or future programs are planned that could add to potential cumulative impacts. The main cumulative impacts could come from an increase in the potential for fires or a combination of hazardous activities increasing the health and safety risk.

Missile Transfer Facility activities would occur within the facility or areas cleared of nearby vegetation. Any fire resulting from an accident in Missile Transfer Facility operation should not result in a forest fire; therefore, there would be no increased health and safety risk from fires.

#### **4.3.5 INFRASTRUCTURE**

This section addresses the potential impacts to Eielson AFB infrastructure due to construction and operation of the Missile Transfer Facility.

##### **Construction**

###### *Solid Waste*

The Fairbanks North Star Borough Landfill serves as the regional landfill and accepts waste from Eielson AFB. It is expected that construction and operation waste from the Missile Transfer Facility would go to this landfill. The landfill, which has been in operation for 30 years, is currently having a new cell constructed. It is expected that this landfill would have sufficient capacity to meet the increased solid waste demand from construction of the Missile Transfer Facility.

###### *Electricity*

Eielson AFB, with its own power generation capabilities has a 25-MW available electrical capacity. In addition, Eielson AFB can access an additional 10 MW from the Golden Valley Electrical Association if required. These available electrical capacities would be sufficient to meet the demands of the Missile Transfer Facility. Individual backup generators would be provided for the Missile Transfer Facility.

##### **Operations**

###### *Solid Waste*

It is expected that the North Star Landfill would have sufficient capacity to meet the increased solid waste demand from operation of the Missile Transfer Facility.

###### *Electricity*

Available electrical capacities would be sufficient to meet the operational demands of the Missile Transfer Facility. Individual backup generators would be provided.

##### **Cumulative Impacts**

Some additional new military construction is expected to occur on Eielson AFB. The construction of new facilities could result in a temporary increase in utility demands, which would be accommodated through existing or temporary construction-related utility systems. Operational requirements would be provided by existing or augmented service capacities. No other future programs that could contribute to cumulative utility system impacts have been identified within the region.

Overall, no cumulative utility system impacts are expected under the Proposed Action for the Missile Transfer Facility.

#### **4.3.6 LAND USE**

This section addresses the potential impacts to land use due to the construction and operation of the Missile Transfer Facility on Eielson AFB.

##### **Construction**

Under the Proposed Action, a Missile Transfer Facility would be constructed at Eielson AFB. The Missile Transfer Facility would be constructed on a gravel parking/storage pad located off Mullin's Pit Road approximately 1.6 kilometers (1 mile) from the runway. There are no inhabited structures within close proximity to the proposed construction site. The siting of the Missile Transfer Facility would be in accordance with DoD standards, taking into account the required ESQD.

##### **Operation**

There would be an ESQD around the Missile Transfer Facility. The ESQD falls within the base boundary and would be a compatible land use with everything except the biathlon course and the road. The Missile Transfer Facility would only be operated intermittently. No other land uses or facilities would be affected.

##### **Cumulative Impacts**

Construction and operation of the Missile Transfer Facility at Eielson AFB would affect a tract of land currently designated for military use, but one that is small in comparison to the remainder of Eielson AFB. Because the GMD program would not change the military use of the area, no cumulative land use changes would occur. In addition, this project in conjunction with other planned projects would not combine to create any cumulative land use impacts. No other projects have been identified for Eielson AFB that could contribute to cumulative land use or aesthetic impacts.

#### **4.3.7 NOISE**

This section addresses the potential impacts to noise due to the construction and operation of the Missile Transfer Facility on Eielson AFB.

##### **Construction**

As no noise sensitive receptors are known to exist within 2 kilometers (1 mile) of the proposed Missile Transfer Facility construction site at Eielson AFB, no impacts to the noise environment would be expected from construction equipment noise.

Although a slight increase in vehicles per day would be expected to be added to the Richardson Highway during construction of the Missile Transfer Facility, the location of the 67 dBA  $L_{eq}(1 \text{ hour})$  contour is estimated to occur well within the approximate 91-meter (300-foot) right-of-way. Consequently, no impacts from traffic noise during Missile Transfer Facility construction would be expected.

## **Operation**

The location of the 67 dBA  $L_{eq}(1 \text{ hour})$  contour is estimated to occur well within the approximate 91-meter (300-foot) right-of-way. Consequently, no impacts from traffic noise during Missile Transfer Facility operation would be expected.

## **Cumulative Impacts**

As no noise sensitive receptors have been identified in the vicinity of the construction site, it would not be expected that Missile Transfer Facility construction noise would cause an impact to the noise environment when combined with the noise from other ongoing and future programs. No cumulative impacts from traffic noise during Missile Transfer Facility operation would be expected.

### **4.3.8 WATER RESOURCES**

This section addresses the potential impacts to water resources due to construction and operation of the Missile Transfer Facility and connecting roads and infrastructure on Eielson AFB.

#### **Construction**

The proposed Missile Transfer Facility site is not within the 100-year floodplain. The Missile Transfer Facility would be constructed on a gravel parking/storage pad located off Mullin's Pit Road approximately 1.6 kilometers (1 mile) from the runway. Drainage patterns would only be altered slightly, if at all, and surface water runoff and erosion would be minimal. A minor increase in sediment in adjacent surface waters is possible, but not likely. A Short Term Variance from Water would be required if potential effects on surface water are identified during preparation of the SWPPP.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.1.5, Hazardous Materials and Hazardous Waste Management. The proposed action activities are not likely to aggravate current drinking water level exceedences.

#### **Operation**

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow all applicable spill prevention, control, cleanup, and emergency response procedures.

Impacts from storm water runoff are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the Missile Transfer Facility, and would include the BMPs that would be implemented. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff.

### **Cumulative Impacts**

Construction and operation of a Missile Transfer Facility at Eielson AFB would only affect a very small portion of the base. No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts. All construction and operations would be completed in accordance with state and Federal water resources regulations.

## **4.3.9 ENVIRONMENTAL JUSTICE**

This section addresses the potential environmental justice impacts due to construction and operation of a Missile Transfer Facility on Eielson AFB.

### **Construction and Operation**

There would not be disproportionately high and adverse environmental or human health effect on minority and low-income populations around Eielson AFB. Moose Creek census area, the closest community near Eielson AFB, has a 20.29 percent minority population and 9.42 percent low-income population. This population percentage is above the Fairbanks North Star Borough Census Area ROI for this location of 19.36 percent minority and 7.58 percent low-income population. However, the small difference in both low-income and minority populations from the larger population are not a meaningful difference for environmental justice analysis.

### **Cumulative Impacts**

No other projects or activities in the region have been identified that would contribute to potential cumulative environmental justice impacts.

## **4.4 BEALE AFB, CALIFORNIA**

The proposed activities at Beale AFB include interior modifications to the first floor of the existing EWR building in order to construct a new Computer Maintenance Operations Center. There would be no change to the existing water, wastewater, solid waste, and electricity use as a result of the Preferred Alternative. There would no change to the exterior of the radar building. The proposed activities would also replace electronic hardware and computer software to enhance detection and discrimination capabilities, as analyzed in Appendix H of the NMD Deployment EIS. The analysis of Appendix H of the NMD Deployment EIS is incorporated by reference and can be briefly summarized as there would be no change to the radiated peak or average power levels emitted by the Beale radar, nor would there be any change to the operating bandwidth. Thus the Proposed Action would not increase the total energy emitted by the radar in any way. Staffing levels and daily operations would remain essentially unchanged, as the radar would perform GBI VOC test site related testing for only brief amounts of time. Based upon these considerations, this document examines only cultural resources since the EWR has been identified as Cold War era property, environmental justice, and health and safety.

#### **4.4.1 CULTURAL RESOURCES**

Preparation of HABS/HAER documentation or other mitigations suggested by the California SHPO as part of the programmatic agreement with Beale AFB would be implemented. No additional potential impacts to cultural resources are anticipated.

#### **4.4.2 HEALTH AND SAFETY**

Modifications of facilities are routinely accomplished for both military and civilian operations and presents only occupational-related effects on the health and safety for workers involved in the performance of construction activity. All construction would be conducted in accordance with applicable regulations and permits and no impacts to health and safety are expected.

As analyzed in the NMD Deployment EIS, the main health and safety concern from operation of the UEWR at Beale AFB in a GBI VOC test site environment would be associated with RF radiation. However, the UEWR's radiated peak, average power, and operating bandwidths would remain unchanged from current operations of the EWR. Therefore, the proposed upgrade would be in compliance with the applicable standards.

#### **4.4.3 ENVIRONMENTAL JUSTICE**

There would be no disproportionately high and adverse environmental or human health effects on minority or low-income populations around Beale AFB.

### **4.5 DELTA JUNCTION, ALASKA**

If Fort Greely is selected as the GBI VOC site, there would likely be multiple contractors performing construction work. It is likely that the construction contractors would need to arrange for the temporary housing of their workers at a site located outside of Fort Greely. MDA's oversight role for the contractor housing action is limited to determining whether the construction contractor selected housing method is properly charged to the contract. As the construction contracts have not yet been awarded, and thus the contractor housing plans have not yet been submitted, this section will analyze possible housing methods that the construction contractors may use. Construction contractor personnel could be accommodated through the use of existing housing or other buildings in or near Delta Junction. Alternatively, a mancamp could be established on newly developed land in the same area. The land or existing facilities used could either be leased or purchased from private, City, or state-owned lands. Construction and operation of a mancamp is not likely to result in air quality impacts. A backup generator could be utilized as an emergency source of power for the mancamp. The number of construction workers in the mancamp is likely to be lower during the winter, which is when air quality conditions in Alaska are poorest due to climatic conditions.

#### **4.5.1 INFRASTRUCTURE**

##### **Water**

According to analysis in the NMD Deployment EIS, based on 360 personnel, construction worker-related water usage would be approximately 0.12 million liters (0.03 million gallons) per day.

If existing housing is used to accommodate construction contractors, existing wells serving those houses should be adequate. However, the underlying aquifer has the capacity to accommodate new wells if required. New wells and any proposed community water system would be constructed in accordance with local and state regulations and would be certified as required.

##### **Wastewater**

If existing housing is used to accommodate construction workers, existing septic systems serving those houses should be adequate. A new septic wastewater facility to support a construction contractor mancamp would be constructed and operated in accordance with local and state regulations, and would be certified as required.

##### **Solid Waste**

Solid waste could be disposed of at the Delta Junction Landfill or transported to the North Star Landfill in Fairbanks. As the Delta Junction Landfill is currently one-third full, the waste generated from housing the construction workers during the estimated 2-year period of construction is not likely to have a substantial impact on the ability to dispose of solid waste within the ROI.

##### **Electricity**

As mentioned in section 3.5.1, electricity is provided by the Golden Valley Electric Association, which has a generating capability of 224 MW of power, with an additional 70 MW available from other commercial sources. Golden Valley Electric Association would have the capacity to furnish required electricity to construction mancamps in the Delta Junction region, or to existing facilities used more intensively to temporarily house construction workers. Existing lines might need to be minimally extended to connect to newly created construction mancamps. Construction contractors may also elect to provide generators as an emergency backup. This is not considered to be highly likely, however, as the Golden Valley Electric Association is a reliable source of power, and the mancamps do not have a higher need for reliable power than does any other residential facility. Providing electricity to mancamps consistently by generator, rather than by use of the commercial source of power, would likely be more expensive and environmentally harmful.

#### **4.5.2 SOCIOECONOMICS**

Construction of the GBI VOC test site at Fort Greely could result in a mancamp being established in Delta Junction to house up to 400 construction contractor personnel.

The GBI VOC test site construction program would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. A proportion of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, at local stores and from local suppliers, would generate additional income and jobs within the local economy. If construction contractors elect to house their workers in part by leasing or purchasing existing housing stock, the rental or purchase rate for housing may temporarily increase, which would be a beneficial impact to the local economy. Based on the experience of other construction projects at the base, the ratio of dependents to workers would be very low.

Only a small additional enrollment in the local school districts is expected as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

#### **4.5.3 ENVIRONMENTAL JUSTICE**

This section addresses the potential environmental justice impacts due to construction and operation of a contractor mancamp in the vicinity of Delta Junction.

##### **Construction and Operation**

There would be no disproportionately high and adverse environmental or human health effects on minority or low-income populations around Delta Junction.

##### **Cumulative Impacts**

No other projects or activities in the region have been identified that would contribute to potential cumulative environmental justice impacts.

#### **4.6 CLEAR AFS, ALASKA**

As discussed in Chapter 2, Clear AFS is an alternative location to establish the GBI VOC test site. Proposed activities would include construction and operation of six GBI silos and corresponding support facilities such as a mancamp, one IDT, and one DSCS. These activities would generally be expected to have the same effects as those described in section 4.1 for Fort Greely. Those activities that may result in different impacts are described below.

#### 4.6.1 AIR QUALITY

This section addresses potential environmental impacts caused by changes to the air quality due to the proposed construction and operation of the GBI VOC test site.

##### Construction

###### *GBI and BMC3*

If Clear AFS were to be chosen as the location for the GBI VOC test site, construction would disturb up to 162 hectares (400 acres). This estimate includes ESQD areas that would not result in disturbed ground, therefore the estimate presented and analyzed in the NMD Deployment EIS for disturbance of up to 243 hectares (600 acres) would still be applicable.

The proposed construction would cause temporary localized increases in air emissions. Emissions associated with construction activities include fugitive dust from ground disturbance, combustion byproducts from construction equipment, and emissions from solvents and architectural coatings. Ground disturbance would generate dust (PM-10) in the immediate vicinity of the construction. The levels of dust generated would change through time depending on the level of activity, the weather, and the condition of the ground itself. It is expected that the majority of grading would be accomplished during the first 12 months of construction and that the majority of overall ground disturbance would occur during the first 2 years. Potential emissions from mobile and stationary construction equipment, as well as asphalt and architectural coating activities, are also considered in the air quality analysis.

Current base-wide PM-10 emissions total 57 metric tons (63 tons). According to calculations performed for the NMD Deployment EIS based on clearing 243 hectares (600 acres), approximately 983 metric tons (1,084 tons) of PM-10 (fugitive dust and combustion emissions) would be generated during 2 years of construction. Clearing anticipated for the Proposed Action would fall within this parameter.

Increases in mobile emissions could also cause increases in ambient levels of some pollutants, such as hydrocarbons, carbon monoxide, nitrogen oxides, and particle emissions. The primary pollutant of concern from mobile sources in Alaska is carbon monoxide. As such, this is the only pollutant from mobile sources analyzed in the NMD Deployment EIS and this study. Up to 80 percent of carbon monoxide emissions contributing to exceedances of the NAAQS in Fairbanks have been attributed to mobile sources. Cold starts during moderately cold weather, prolonged idling periods, and low-level temperature inversions all contribute to pronounced air quality impacts from motor vehicle emissions in cold climates.

Using data supplied by the ADEC, it was determined that under these conditions each person would cause the emission of up to 430 kilograms (948 pounds) of carbon monoxide per year. Construction and use of the proposed mancamp on Clear AFS would require less driving time and result in substantially lower carbon monoxide emissions. Current base emission inventory operations emissions do not include traffic emissions. However, there

are allowances for anticipated traffic increases in the area's transportation budget. As such, project-related traffic is not expected to impact air quality.

The implementation of standard dust suppression techniques and a vehicle maintenance program would minimize fugitive dust and vehicle exhaust emissions, and would help to maintain the area's current high air quality.

Construction would be conducted in accordance with applicable regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceases, air quality would return to its former levels. It is anticipated that the proposed construction would not cause exceedances of the NAAQS or state standards beyond the immediate construction zone and would not have a long-term impact to air quality in the area.

### *Mancamp*

At present, the requirements for a mancamp for GBI VOC test site activities at Clear AFS have not been confirmed. Administrative, operations, and construction personnel may be housed in existing facilities. If required, a mancamp for construction contractors would be temporary and established approximately in the center of the installation, in a previously disturbed area as indicated in figure 2-14. The selected site would be cleared, leveled, and graveled. It would be designed similar to the Fort Greely administrative mancamp described in section 2.3.4 and shown in figure 2-12, and would house the 330 construction contractor personnel estimated to be required to accomplish the GBI VOC test site construction. Impacts from construction of the mancamp would be similar to those discussed for the GBI and BMC3 sub-components, but on a smaller scale.

### **Operation**

#### *GBI and BMC3*

The use of new or upgraded heaters and boilers, along with emergency power supplies, vehicular emissions, and normal maintenance-related activities would all cause potential operational air quality impacts. Power would be provided by offsite commercial power sources to most of the proposed locations. Emergency generators would be maintained and operated onsite for backup power under the appropriate permits and restrictions.

The current proposal would require connection to offsite commercial power sources with emergency generators maintained onsite ranging in output from 75 to 900 kW at the GBI site. In addition to the generators themselves, a dedicated AST would be installed adjacent to each generator, ranging in capacity from approximately 15,140 to 75,710 liters (4,000 to 20,000 gallons). Assuming the generators would be in operation up to 250 hours per year, they would be incorporated into the current Clear AFS Title V Air Permit and would be subjected to the permitted restrictions. Where necessary, the installation of new boilers, heaters, or power generators (or upgrades to existing units) could cause air quality impacts through increased emissions of pollutants. Depending on the modifications required and air quality in the affected area, installation or upgrades of these sorts could require New Source Reviews, PSD analyses, and/or modification or establishment of Title V Air Permits. All areas under consideration are in attainment areas

and as such no General Conformity Applicability Analysis requirements are anticipated under the Proposed Action.

Normal maintenance activities would result in the emission of relatively minor levels of pollutants, consisting primarily of particulate and volatile organic compound emissions. None of the potential sites have high ambient levels of either of these pollutants. As such, the small amounts of solvents, cleaners, paints, and grit involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as the Title V Air Permit. Maintenance-related emissions are not addressed further in the air quality analysis.

The IDT would be powered by an offsite commercial source with a backup 250- to 300-kW emergency generator. For backup power, the generator would be operated for maintenance cycling and emergency power conditions in accordance with applicable permits. The generator would be fueled through an AST with a capacity of approximately 3,785 liters (1,000 gallons), also used under applicable permits. The backup generator would be tested up to approximately 250 hours per year.

Clear AFS is also within proximity to the Denali National Park, which is a Class I PSD area. However, it is not within 10 kilometers (6 miles) and the program would not be required to perform a PSD review based on proximity to a Class I PSD area. Operation of the emergency generators would not be anticipated to cause decreased visibility or increased pollution concentrations within the park's area, and would not be anticipated to have an impact on Denali National Park.

Construction and operation of the GBI and BMC3 facilities at Clear AFS would not be anticipated to cause exceedances of the NAAQS or state standards, and as such would not be expected to cause any change in the area's attainment status.

#### *Mancamp*

Normal maintenance activities would result in the emission of relatively minor levels of pollutants, consisting primarily of particulate and volatile organic compound emissions. None of the potential sites have high ambient levels of either of these pollutants. As such, the small amounts of solvents, cleaners, paints, and grit involved in normal maintenance activities would not cause a significant impact to air quality. However, potential emissions from these activities would be accounted for in applicable operating permits, such as the Title V Air Permit. Maintenance-related emissions are not addressed further in the air quality analysis.

#### **Cumulative Impacts**

Construction and operation of the GBI VOC test site activities, in combination with ongoing activities at Clear AFS and in the region, would not result in long-term cumulative air quality impacts.

#### 4.6.2 BIOLOGICAL RESOURCES

Clear AFS has been selected as a potential location for the GBI VOC test site. This could require grading of up to 162 hectares (400 acres), less than 5 percent of the total acreage on the station, for construction of a GBI field, BMC3 sub-components, a new access road, and utility corridors.

##### **Construction**

###### *GBI and BMC3*

**Vegetation.** Aspen-birch forest, aspen-black spruce forest, and possibly gravel barrens habitat would be removed during construction of the GBI VOC test site at Site A (figure 3-10). This represents a small portion of the total vegetation available on base. Although gravel barrens can possess unique plants, there is no evidence that they provide critical habitat for wildlife. Construction would remove less than 5 percent of the total gravel barrens located on the station.

Aspen-black spruce forest, black spruce forest and woodland, and aspen-birch forest could be removed during construction at Site B (figure 3-10). This also represents a small portion of the total vegetation available on base.

**Wildlife.** Construction activities could potentially remove vegetation used by migratory or other nesting birds. However, less than 5 percent of the total vegetation available on-base would be removed, and adjacent areas would provide similar habitat.

Wildlife in the immediate area (moose, bears, lynx, and migrating and resident birds such as the olive-sided flycatcher, northern goshawk, and harlequin duck) could be startled by construction noise and could possibly avoid or leave the area during construction. Available similar habitat exists adjacent to the ROI. No major wildlife corridors would be disturbed. The Nenana River, a designated anadromous fish stream west of the proposed sites, would not be impacted by construction or operation activities.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered plant or wildlife species or critical habitat has been identified at Clear AFS. Protected bird species, including the recently delisted peregrine falcon, may migrate through the area, and therefore could potentially be disturbed by construction-related noise. However, this unlikely disturbance would be short-term and is not expected to alter migration patterns.

**Environmentally Sensitive Habitat.** Construction activities could cause impacts to wetlands if Site A or Site B at Clear AFS is selected. Site B is located in an area where wetlands are more prevalent. These wetlands do provide habitat for several state species of concern, such as the olive-sided flycatcher, gray-cheeked thrush, Townsend's warbler, and blackpoll warbler. Actual siting of the GBI field could reduce impacts by avoiding wetlands where practicable. Selection of IDT site 2 would have a slightly higher potential to result in impacts to wetlands. Selection of DSCS sites 1 and 3 would have a slightly higher potential to result in impacts to wetlands. The wetlands could potentially be affected by the project through filling, draining, trenching, and other general construction activities.

Because wetlands generally provide wildlife habitat, any significant changes to the wetlands would likely result in subsequent impacts on wildlife in the area. Wetlands associated with the Nenana River are located west of the site and would not be affected by program activities.

As mentioned above, wetlands would be avoided to the maximum extent practicable. BMPs (such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff) would be implemented. Section 404 permits and state 401 water quality certification would be obtained after actual siting of the GBI field and before any discharge of fill material. The Alaska water quality certification would declare that any discharge to navigable waters would comply with applicable provisions of the Clean Water Act, including water quality standards. Compliance with the required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations through the public and agency review process.

#### *Mancamp*

**Vegetation.** No sensitive vegetation species have been identified within the proposed mancamp area. The removal of vegetation from the proposed mancamp site would occur during construction.

**Wildlife.** Construction ground disturbance and equipment noise-related impacts could include the loss of habitat, displacement of wildlife, increased stress, and disruption of daily/seasonal behavior. The impacts to wildlife would be the same as those discussed above. The disturbance is not expected to alter migration patterns or wildlife corridors.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered species have been identified at Clear AFS.

**Environmentally Sensitive Habitat.** A small area of wetlands could be impacted by construction of the mancamp facilities. The wetlands could potentially be affected through filling, draining, trenching, and other general construction activities. Actual siting of the mancamp would avoid wetlands to the maximum extent practicable. Because wetlands generally provide wildlife habitat, any significant changes to the wetlands would likely result in subsequent impacts on wildlife in the area. Any disturbance to these wetlands would be minimized as discussed above.

#### **Operation**

##### *GBI and BMC3*

**Vegetation.** No impacts to vegetation are anticipated during operation of the GBI field and BMC3 sub-components.

**Wildlife.** During operation, the GBI field would be dormant except for occasional building maintenance activities. Only minor, short-term impacts to wildlife are anticipated as a

result of these activities. Security lighting could potentially attract wildlife to the project areas; however, any impacts, such as startling when personnel are in the area, would be minimal.

During normal operations the IDT and DSCS would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated from operations.

Most operational impacts to wildlife from the IDT and DSCS terminal would come from security lighting and noise from the electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise levels expected at the site could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities for backup generators and are not anticipated to substantially affect wildlife.

**Threatened and Endangered Species.** No Federal or state listed threatened or endangered plant or wildlife species or critical habitat has been identified at Clear AFS. Protected bird species, including the recently delisted peregrine falcon, may migrate through the area, and therefore could potentially be disturbed by operational noise and the presence of personnel. However, this unlikely disturbance would be short-term and is not expected to alter migration patterns.

**Environmentally Sensitive Habitat.** No impacts to sensitive habitat are anticipated during operation of the GBI field and BMC3 sub-components.

#### *Mancamp*

**Vegetation.** No impacts to vegetation are expected during operation of the mancamp.

**Wildlife.** Only minor, short-term impacts to wildlife are expected due to the presence of personnel at the mancamp. Security lights could attract wildlife to the area; however, any impacts would be minimal.

**Threatened and Endangered Species.** No threatened or endangered species have been identified at Clear AFS.

**Environmentally Sensitive Habitat.** No impacts are anticipated to sensitive habitat during the operation of the mancamp.

#### **Cumulative Impacts**

Cumulative impacts would result from increased activity during construction and loss of habitat at the proposed site. Additional similar habitat in the region would minimize these impacts. Filling in wetlands at Site A or B could reduce the amount of wetlands on Clear

AFS. However, construction on either site would contribute only slightly to the cumulative reduction of wetlands in the region and state.

No other future programs that could contribute to cumulative biological resource impacts have been identified at Clear AFS or within the region.

#### **4.6.3 CULTURAL RESOURCES**

This section addresses the potential impacts to cultural resources due to construction and operation of the GBI VOC test site at Clear AFS.

##### **Construction**

###### *GBI and BMC3*

**Prehistoric and Historic Archaeological Resources.** Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. Archaeological surveys and predictive modeling for Clear AFS indicate that there are no recorded prehistoric or historic archaeological sites within the ROI and a low probability for these types of sites to occur. Based on the previous investigations, the SHPO has concurred that no further studies have been recommended for the area encompassed by the ROI. As a result, proposed construction of the GBI VOC test site and associated support facilities would have no effect on prehistoric and historic resources. However, if during the course of the GBI VOC test site program activities, cultural items are inadvertently discovered, activities would cease in the immediate area and the SHPO and potentially affiliated Native Alaskan entities would be notified through the host installation. Subsequent actions would follow guidance provided.

**Historic Buildings and Structures.** The only historic buildings and structures at Clear AFS are those associated with the Ballistic Missile Early Warning System and the White Alice Communications System. None of these properties are within the direct ROI for the GBI VOC test site facilities; therefore, no effects are expected.

**Native Populations/Traditional Resources.** There have been no traditional cultural properties identified within the ROI or Alaska Native issues identified for the Clear AFS. No issues or concerns were raised during the NMD Deployment EIS analysis.

**Paleontological Resources.** Although paleontological resources are known to occur within the region, none have been identified within the boundary of Clear AFS; therefore, no effects are expected. However, if fossils are unexpectedly discovered, subsequent actions may be required.

###### *Mancamp*

No impacts to cultural resources are anticipated. However, if during the course of mancamp construction cultural items are inadvertently discovered, activities would cease in the immediate area and the SHPO and potentially affiliated Native Alaskan entities would

be notified through the host installation. Subsequent actions would follow guidance provided.

### **Operation**

Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. No impacts to cultural resources are anticipated during operation of the GBI VOC test site and support facilities at Clear AFS.

### **Cumulative Impacts**

No other future programs that could contribute to cumulative cultural resources impacts have been identified at Clear AFS or within the region.

## **4.6.4 GEOLOGY AND SOILS**

This section addresses the potential impacts to geology and soils at Clear AFS due to the construction and operation of the GBI VOC test site.

### **Construction**

#### *GBI and BMC3*

It is estimated that the proposed GBI, IDT, and DSCS facilities would disturb up to 162 hectares (400 acres), which is less than that analyzed for the NMD Deployment EIS. The NMD Deployment EIS determined that there was no significant impact to geology and soils at Clear AFS resulting from similar proposed activities.

The potential for soil erosion is minimal however. BMPs would be employed during construction to further mitigate deleterious effects to soils resulting from grading and excavations. These measures could include limiting the amount of area exposed, creating sediment basins to control flow, and adding protective covering to the slopes.

Because of the well-drained nature of the area soils, the presence of unstable permafrost is not anticipated to be a problem. However, before design and construction, a comprehensive geotechnical investigation would be conducted to determine the exact nature of the soils at each facility location in the area. In the unlikely event that permafrost was encountered during these investigations, the site layout would be adjusted to minimize any impacts to these areas. These investigations would also determine the depth to groundwater. Depending on the depth, missile silos may be slightly elevated to avoid de-watering during construction and operations.

Construction on Clear AFS would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process, but this use should not deplete the available resources in the area. Purchase of state-owned gravel would be under a materials sale contract.

Clear AFS lies in seismic zone 3, where major earthquake damage and peak ground accelerations ranging from 0.2 to 0.3g have a 10 percent probability of occurring at least once in 50 years. Construction of new facilities would incorporate earthquake-resistant designs to reduce the potential of substantial impacts from high seismic ground motions.

#### *Mancamp*

There would be a small amount of disturbance associated with the construction of the mancamp. The selected site would be cleared, leveled, and graveled. Construction impacts would be similar to those discussed for the GBI and BMC3 components, on a smaller scale.

#### **Operation**

Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the GBI VOC test site, and no impacts to geology and soils are anticipated.

#### **Cumulative Impacts**

No cumulative impacts are anticipated as a result of current ongoing mission activities. Once vegetation is in place, no long-term cumulative impacts to soils would be expected from erosion at the site. Overall, no cumulative impacts are expected from construction and operation activities at Clear AFS.

### **4.6.5 HAZARDOUS MATERIALS AND WASTE**

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with construction and operation of a GBI VOC test site on Clear AFS.

#### **Construction**

##### *Hazardous Materials and Waste Management*

Construction activities would be centralized as much as possible and would take place at the selected project site. Hazardous wastes generated during construction would consist of materials such as motor fuels, waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. These hazardous materials would be containerized and properly disposed of by the individual contractors. The expected hazardous materials and wastes would be similar to those discussed in section 4.1.5 and listed in table 4-1. Storage for these hazardous materials and wastes would be located in protected and controlled areas designed to comply with site-specific spill prevention, control, and countermeasures. Appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from construction activities.

### *Pollution Prevention*

GBI VOC test site activities at Clear AFS would utilize the existing hazardous materials management program at the station. This program controls and reduces the use of hazardous materials on the installation. In addition, the current base Pollution Prevention Management Plan includes a hazardous materials pharmacy program. Hazardous materials associated with the Proposed Action would be administered through this pharmacy program. Program personnel would continue to update the system-wide Pollution Prevention Plan that outlines strategies to minimize the use of hazardous materials.

### *Installation Restoration Program*

IRP investigations at Clear AFS since 1991 have identified 23 sites of potential contamination. Of these sites, 22 are considered closed sites, pending state written approval. Eleven of these sites are located on or near proposed support facilities locations. It is not anticipated that the current schedule of investigations and any remediation required at any site on Clear AFS would be affected.

Overall, before beginning construction at Clear AFS, activities would be coordinated with the appropriate base personnel to avoid accidental impacts to remediation efforts. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures could be taken to avoid human contact with any contaminated areas.

### *Asbestos*

Some of the facilities proposed for modification and demolition as part of the GBI VOC test site at Clear AFS may contain asbestos. Prior to any existing building modifications or demolition for construction or operation, it would be determined if asbestos is present in the modification area. If asbestos is present, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

### *Polychlorinated Biphenyls*

Remaining PCB-containing equipment on Clear AFS, including filters, ballasts, and small capacitors, have been identified and are scheduled for removal and disposal in accordance with Federal and state regulations. No PCB-based materials would be used at the GBI VOC test site.

### *Lead-based Paint*

Some of the facilities proposed for modification and demolition as part of the GBI VOC test site at Clear AFS may contain lead-based paint. Prior to any existing building modifications or demolition for construction or operation, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

## Operation

### *Hazardous Materials Management*

Regular maintenance and operations activities for the GBI and BMC3 sites would include a low but continuous level of activity requiring the use of hazardous materials. The anticipated amounts of hazardous materials to be used are not known; however they could include protective coatings, lubricants and oils, motor and generator fuels, isopropyl alcohol, backup power batteries, adhesives, and sealants.

All hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Clear AFS and would comply with the appropriate Federal, state, and local regulations.

Additional hazardous materials at the proposed GBI field would be the nitrogen tetroxide and hydrazine inside the EKV of each GBI (less than 19 liters [5 gallons]). Impacts of these liquid fuels would be similar to those described in section 4.1.5.

Transportation of the liquid propellants would be in accordance with U.S. Department of Transportation regulations. In addition, emergency response personnel and equipment would accompany the fueled EKV during transport to handle and contain hazardous materials in the unlikely event of a accident and spill during transportation. The hazardous materials generated during an accidental leak during transportation would be disposed of in accordance with Federal, state, and local regulations.

One piece of equipment used on the EKV consists of a klystron tube, which contains small amounts of beryllium. Beryllium is listed on the Toxic Substance Control Act Inventory. If maintenance is required, a new tube would be brought onsite and the replaced tube sent back to the manufacture for repair.

### *Hazardous Waste Management*

Any hazardous waste generated from the use of hazardous material would be managed in accordance with appropriate Federal, state, and local regulations. An appropriate hazardous waste management plan would be developed for the site.

Clear AFS has the mechanisms in place to store, manage, and dispose of hazardous waste, including any additional propellant waste that could be generated if a leak within the EKV should occur. If a leak were to occur, all hazardous waste would be handled in accordance with appropriate regulations. In addition, there would be an appropriate spill containment team with training in the handling of the liquid propellants with the necessary equipment to manage any leak of the liquid propellants at the GBI VOC test site. All hazardous waste generated at the GBI VOC test site would be handled through the base's treatment, storage, and disposal facility.

### *Pollution Prevention*

The GBI VOC test site system-wide Pollution Prevention Plan would be implemented for proposed activities at Clear AFS.

### *Installation Restoration Program*

GBI VOC test site operational activities are not expected to impact the ongoing cleanup activities at Clear AFS.

### *Asbestos*

No impacts from asbestos are anticipated during operation of the GBI VOC test site.

### *Polychlorinated Biphenyls*

No PCB-based materials would be used for operation of the GBI VOC test site.

### *Lead-based Paint*

No lead-based paint would be used in the new or modified proposed GBI VOC test site facilities.

### *Radon*

The radon assessment and mitigation program at Clear AFS is under the direction of the bioenvironmental engineer at Eielson AFB. A Radon Assessment and Mitigation Program Assessment Survey found no samples exceeded the 4 picocuries per liter limit. Radon is not a concern at Clear AFS.

### *Pesticides*

Pesticides would be applied in accordance with Clear AFS procedures using personnel certified as pesticide applicators. The small amount of pesticides required would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts at Clear AFS.

### **Cumulative Impacts**

Potential cumulative hazardous materials and hazardous waste impacts could occur at Clear AFS with the combination of GBI VOC test site activities and ongoing and future hazardous materials and hazardous waste management activities. Current and future activities at Clear AFS would not result in a change in ongoing hazardous materials and hazardous waste management programs. The construction and operation of one or more GBI VOC test site activities at Clear AFS in combination with ongoing installation activities and future base programs would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Clear AFS. However, Clear AFS has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, no cumulative hazardous materials or hazardous waste management issues are anticipated at Clear AFS.

#### **4.6.6 HEALTH AND SAFETY**

This section addresses the potential impacts to health and safety associated with construction and operation of the proposed GBI VOC test site at Clear AFS.

##### **Construction**

Construction of the proposed alternative sites would not occur within any EMR hazard areas on the installation. Either of the proposed GBI VOC test site locations would be designed to be outside of the EMR hazard area for the phased-array radar, and would therefore not represent any EMR safety issues to construction workers. The proposed GBI sites would be outside of the Clear Airport runway approach zones.

##### **Operation**

The GBI silos, EKV Assembly and Checkout Building, the Interceptor Receiving and Process Building, and the Interceptor Storage Facilities would all require the establishment of ESQDs at Clear AFS. The establishment of the ESQDs would go through DoD review to ensure that there are no incompatible health and safety issues. The proposed ESQDs associated with GBI VOC test site for either proposed alternative site would fall within the base boundary in an area with no inhabited structures; therefore, an explosion of the GBI within the site should not pose a public health and safety risk.

During operation, the GBI field would be dormant, except for occasional maintenance activities. According to the NMD Deployment EIS, a fire station would be built to meet the GBI facility requirements. In addition, to avoid potential forest fires, appropriate fire breaks would be established around the facility. For the GBI site operation, a health and safety plan would be prepared that would include procedures to handle emergencies involving the GBI. This plan would describe how to handle each type of emergency, the appropriate base and off-base contacts, and an evacuation plan, if necessary.

Either potential GBI VOC test site alternative would be outside the EMR safety zones of the new phased-array radar on Clear AFS. In addition, an EA prepared for the phased-array radar concluded that the radar is not expected to be a threat to fuel handling operations or ground-based electroexplosive devices.

During normal operations, the IDT would not transmit except during annual testing of the equipment. During this test, EMR would be generated. Based on American National Standards Institute (ANSI) C95.1, the personnel exposure limit for the IDT operating frequency is 10 milliwatts per square centimeter for a 1.65-minute exposure. Based on the 1,500-watt IDT, EMR levels would not exceed personnel exposure limits established by ANSI during the annual test. The remainder of the year, the IDT would not generate any EMR.

Any GBI mishap that would result in a solid propellant fire could generate hazardous air pollutants. As discussed in section 4.1.6, at no time is it expected that peak hydrogen

chloride (the toxic constituent of main concern) emission levels would exceed public exposure guidelines.

Transportation, EKV assembly, and GBI integration would involve the same activities and environmental effects as described for these activities at Fort Greely in section 4.1.6.

As discussed above, the potential for a liquid propellant leak is considered remote. However, if a liquid propellant leak were to occur within the GBI, there is the potential for health hazard from the gases. As discussed above, the hazardous extent of the cloud could exceed the OSHA Permissible Exposure Level up to 760 meters (2,493 feet) from the leak for nitrogen tetroxide. However, the anticipated level of exposure to nitrogen tetroxide in this area would only be expected to be mildly irritating to the eyes and nose and could include coughing. No irreversible damage would be expected from exposure at these levels. The most likely areas for a spill to occur would be within the EKV Assembly and Checkout Building, MAB, the Interceptor Storage Facility, and at the GBI missile field. A hazardous emission at Clear AFS at the GBI Alternative A site would not affect any areas outside of the base boundary and would not include the administrative areas on the base; therefore, there would be minimal public health and safety risk.

A release at the Alternative B site could exceed the base boundary by 122 hectares (302 acres) and would include the administrative and housing area on the base. However, there are no occupied structures in the off-base area that could be potentially exposed. If a spill did occur, emergency response personnel would evacuate this area.

No health and safety impacts associated with other proposed activities, including mancamps, are anticipated.

### **Cumulative Impacts**

Potential cumulative health and safety impacts are not expected to occur at Clear AFS with the combination of GBI VOC test site activities and ongoing health and safety risk from current military activities. The only mission on Clear AFS that represents a health and safety risk is associated with the EMR generated from operation of the EWR. However, no cumulative EMR effects are anticipated.

Although there is the potential for aircraft mishaps to occur in the airspace over the alternative GBI VOC test sites because of the proximity to Clear Airport, the likelihood of an aircraft mishap to occur is considered remote due to the low use of this runway. In addition, the GBI VOC test sites on Clear AFS are outside of the approach and departure clear zones.

Overall, it is not expected that GBI VOC test site construction and operation at Clear AFS would cause a significant increase in the health and safety risk when combined with other ongoing and future programs.

#### 4.6.7 INFRASTRUCTURE

This section addresses the potential for impacts to infrastructure due to the proposed construction and operation of the GBI VOC test site.

##### **Construction**

###### *GBI and BMC3*

**Water.** It is expected that most of the water usage increase would occur on-base as a result of construction workers taking up temporary residence in the mancamp. Construction worker-related water usage could be approximately 0.11 million liters per day (0.03 million gallons per day). The existing private wells in the surrounding ROI and the available capacity in Nenana of 0.4 million liters per day (0.1 million gallons per day) have sufficient capacity to handle this potential increase. On-base water usage from construction would also be related to site watering and any required batch plants. The available capacity of approximately 20 million liters per day (5 million gallons per day) would be sufficient to handle this increased demand.

**Wastewater.** An increase in wastewater usage would occur under construction of the GBI VOC test site in relation to on-base construction workers taking up temporary residence in the mancamp. Construction worker-related wastewater generation would be approximately 0.11 million liters per day (0.03 million gallons per day). It is likely that this increase in demand may shorten the leach fields current 10- to 20-year life span. Portable wastewater facilities would be used for construction workers during the workday on Clear AFS.

**Solid Waste.** The Clear AFS landfill is expected to reach capacity between 2008 and 2013. However, current plans are to close the landfill in 2002 or 2003 and utilize the new Denali Borough landfill. This landfill should have enough existing capacity for the increase in solid waste from the GBI VOC test site program construction.

**Electricity.** Clear AFS has a 13.5-MW available electrical capacity from the current plant. In addition, the available capacity of the regional provider is approximately 90 MW. These available electrical capacities would be sufficient to meet the demands of the GBI VOC test site at Clear AFS. Individual backup generators would be provided for the proposed facilities.

###### *Mancamp*

Lighting would be installed for security and parking at the mancamp location. All utility services would be provided by the Government, and would be brought to the site with minimum connectivity. Minor heating, electrical, and plumbing system repairs would be performed as necessary in the additional support buildings provided for warehouse and equipment maintenance space.

## **Operation**

### *GBI and BMC3*

**Water.** Most of the operations-related water usage would occur on base. New housing would be built for operation workers on Clear AFS, which would tie into the existing base water supply. On-base water usage would be expected to increase by 0.05 million liters per day (0.01 million gallons per day), which is within the available base capacity of approximately 20 million liters per day (5 million gallons per day). Off-base water usage from operations is expected to be minimal since GBI VOC test site-related personnel would stay on the installation. Since the proposed facilities could be located away from the existing base water system, new wells may be required. New wells and any proposed water system would be constructed and operated in accordance with local and state regulations and would be certified as required.

**Wastewater.** Most of the operations-related wastewater generation would occur on-base. New housing would be built for operations workers on Clear AFS, which would tie into the existing base wastewater supply. On-base wastewater generation would be expected to increase by 0.05 million liters per day (0.01 million gallons per day), which could be handled by the existing base leach field. It is likely that this increase in demand may shorten the leach fields current 10- to 20-year life span by 1 to 2 years over a 20-year period. Off-base wastewater generation from operations is expected to be minimal since GBI VOC test site related personnel would stay on the installation. Since the main facilities would be located away from the existing wastewater system, a new septic wastewater facility would have to be constructed. The proposed new system would be constructed in accordance with local and state regulations and would be certified as required.

**Solid Waste.** The new Denali Borough landfill should have enough capacity for the increase in solid waste from the GBI VOC test site program.

**Electricity.** Clear AFS has a 13.5-MW available electrical capacity from the current plant. In addition, the available capacity of the regional provider is approximately 90 MW. These available electrical capacities would be sufficient to meet the demands of the GBI VOC test site at Clear AFS. Individual backup generators would be provided for the proposed facilities.

### *Mancamp*

All utility services would be provided by the Government, and would be brought to the site with minimum connectivity.

## **Cumulative Impacts**

No other future programs that could contribute to cumulative utility system impacts have been identified at Clear AFS or within the region. Analysis of the proposed operation of the new phased-array radar concluded that there would be no impacts to utility system integrity at Clear AFS.

#### **4.6.8 LAND USE**

This section addresses the potential for impacts to land use due to the proposed construction and operation of the GBI VOC test site on Clear AFS.

##### **Construction**

Under the Proposed Action, a GBI VOC test site would be constructed and become operational at one of two alternative sites and existing activities would continue. Proposed ground-based testing on Clear AFS would be compatible with current adjacent land use and zoning. If future flight tests are considered and evaluated, there could be a conflict with the existing radar on Clear AFS. Proposed construction safety zones at either location would be contained well within the boundaries of Clear AFS.

The proposed construction activity would take place at potential Site A, located southeast of the Technical Site close to the landfill, or at Site B, located just north of the Composite Area. Up to approximately 162 hectares (400 acres) of undisturbed land could be altered under either alternative to accommodate the new facilities, which is roughly 5 percent of the total base. The siting of the GBI field and support facilities would be in accordance with DoD standards taking into account ESQD and EMR safety criteria. All of the construction areas fall well within the boundaries of Clear AFS and therefore have no conflicts with adjacent land uses or zoning, and there are no inhabited structures that fall within the construction areas or safety zones. Both proposed GBI sites are currently forested and used for recreation and open space.

The proposed use at either location would be of an industrial nature, but would not significantly alter the amount of open space or recreational areas and would be compatible with the military uses on-base.

In addition to the GBI facilities, construction of housing (mancamp) would be required on Clear AFS. The mancamp would be located adjacent to the existing base dormitories and just south of this area. The new mancamp would be compatible with the existing base land use (residential and open) in this area. There is also the potential for new administrative facilities to be located just north of the existing dormitories or in the Camp Site portion of the base.

##### **Operation**

The GBI field would be in a dormant state during the operation phase with the exception of occasional testing and maintenance. Appropriate safety zones would be established, and all fall within forested areas on-base and are a compatible land use. They would not affect any of the existing facilities at Clear AFS or any of the surrounding land uses. There would be a small loss of land used for recreational activities and hunting by U.S. Air Force and civilian base personnel due to construction and operation.

### **Cumulative Impacts**

Construction of the GBI VOC test site and support facilities would occur on-base in an area designated for military use. The GBI VOC test site would affect approximately 5 percent of the base and would increase the amount of developed land to around 8 percent of the 4,670 hectares (11,542 acres) that make up Clear AFS. Because the area proposed for development is already designated for military use, no cumulative land use changes would occur.

### **4.6.9 NOISE**

This section addresses the potential for impacts to the noise environment due to the proposed construction and operation of the GBI VOC test site at Clear AFS.

#### **Construction**

As stated above, noise from construction equipment usually falls in the range of 70 dBA to 98 dBA at 15 meters (50 feet) from the source. For the construction sites at Clear AFS, the 65 dBA and 75 dBA DNL contours are estimated to occur within approximately 2 kilometers (1 mile) and approximately 0.9 kilometer (0.5 mile) from the construction site, respectively.

However, since no noise sensitive receptors are known to exist within 2 kilometers (1 mile) of the proposed GBI VOC test site construction site at Clear AFS, no impacts to the noise environment would be expected from construction equipment noise.

Since the 67 dBA  $L_{eq}(1 \text{ hour})$  contour is estimated to occur well within the approximate 91-meter (300-foot) right-of-way, no impacts from traffic noise during GBI construction would be expected.

#### **Operation**

Up to approximately 60 additional vehicles per day could be expected to be added to the George Parks Highway during operation activities, if Clear AFS is chosen as the GBI VOC test site location. However, under this condition the location of the 67 dBA  $L_{eq}(1 \text{ hour})$  contour is estimated to occur well within the approximate 91-meter (300-foot) right-of-way. Consequently, no impacts from traffic noise during operation are expected.

### **Cumulative Impacts**

As no off-base noise sensitive receptors have been identified in the vicinity of either potential GBI VOC test site alternative, it would not be expected that proposed construction and operation noise at Clear AFS would cause an impact to the noise environment when combined with the noise from other ongoing and future programs.

#### **4.6.10 SOCIOECONOMICS**

This section addresses the potential impacts to socioeconomics in the region associated with the construction and operation of a GBI VOC test site on Clear AFS.

##### **Construction**

###### *Population*

Construction of GBI facilities would take approximately 2 years, employing on average 400 construction workers a year. It is expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. Fairbanks, the nearest community of any size, had just over 1,800 construction workers in 1996 but, with this exception, there is no local pool of labor on which to call for this type of project.

If 70 percent of the construction workers for the GBI VOC test site came from outside the area, then 120 workers would come from the local labor pool. Experience of other construction projects at Clear AFS suggests that the local labor pool of construction workers would support this ratio of local workers to newcomers.

The isolation and distance of Clear AFS from main population centers, the lack of available housing and other facilities, and the experience of other construction projects at Clear AFS would suggest that the ratio of dependents to workers would be very low.

###### *Employment Income and Retail Impacts*

The GBI VOC test site construction program would generate additional income in the local economy in the form of wages earned by the construction workers and from a proportion of locally purchased materials. A proportion of the wages would be spent locally on lodging, food and transportation. Purchases at local stores and from local suppliers would generate additional income and jobs within the local economy.

At least half of the construction cost would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact.

Many of the jobs would disappear with the completion of the 2-year construction program, making their economic benefits transitory. The impact of construction program expenditures on retailers would be almost entirely concentrated in Fairbanks, as there are few retail outlets in Denali Borough and Nenana.

###### *Impacts on Housing, Education, and Health*

Most construction workers that have been involved in past projects at Clear AFS have been accommodated in local hotels or have commuted from Fairbanks. The Northstar Inn in Healy has 250 beds, while Fairbanks has over 100 bed and breakfast establishments and 30 hotels or motels. Temporary accommodation in the ROI, other than at these two

locations, is strictly limited. A mancamp could be established on Clear AFS to provide living and dining facilities.

The existing health facility at Clear AFS is staffed to support the current personnel complement at Clear AFS. The construction program would more than double the daily workforce at Clear AFS during the peak summer months. As has been experienced at other DoD construction programs, it would be expected that the construction program would lead to an increase in industrial and traffic injuries, therefore placing an increased burden on the existing trained medical personnel in the area. However, the major regional medical facilities in Fairbanks have adequate capacity to handle the increase in demand.

As outlined above, only a very small number of construction worker dependents are likely to live in the ROI. There would, therefore, be only a small additional enrollment in the local school districts as a result of the construction phase of the action. The additional enrollment would not have a significant effect on the resources of the local school district.

#### *Fiscal Impacts*

The main fiscal impact arising from the construction phase would be as a result of purchases made by personnel and their families. Sales taxes would be generated at various locations throughout the ROI.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

#### **Operation**

##### *Population*

The operational phase would directly employ up to 255 personnel, including approximately 115 military and 90 contractor positions and 50 direct jobs associated with GMD base support functions mostly joining the project from outside the region. Because there is a large number of existing base support personnel at Clear AFS, the GBI VOC test site would require less personnel than at the alternative GBI VOC test site location at Fort Greely. Given the specificity of the skills required for the operational phase, almost all those involved would move to Clear AFS from outside of the area.

Clear AFS is classified as a remote base; therefore, dependents would not normally accompany the workforce, all of whom would be encouraged to live at Clear AFS rather than in the surrounding community or in Fairbanks.

##### *Employment Income and Retail Impacts*

The 255 personnel required to carry out the operational phase would generate at least \$7.0 million of direct income per year. Although not all of this would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. The

NMD Deployment EIS estimated that approximately 77 jobs would be generated indirectly by the operational phase of the action.

The majority of these jobs would be created in Fairbanks, the region's service center and only significant outlet for retail spending.

#### *Impacts on Housing, Education, and Health*

The 255 personnel required to carry out the operational phase of the program would be accommodated in the mancamp and other dormitory space on Clear AFS.

Clear AFS has no family housing. Personnel relocating to Clear AFS with dependents are required to house them in Anchorage or Fairbanks. Both communities would absorb the small number of dependents involved with minimal impact. Potential impacts to schools and medical facilities would be similar to those described under the construction phase.

#### *Fiscal Impacts*

The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections as a result of the sales of goods and services by the influx of operational personnel.

Negative fiscal impacts, usually associated with increased education costs for the younger dependents of operational personnel, would be minimal because most would live and work at Clear AFS while their dependents lived elsewhere in the United States.

#### **Cumulative Impacts**

The operational phase of the action would be relatively self-contained. There are no other known projects to which the action would add socioeconomic impacts.

### **4.6.11 WATER RESOURCES**

This section addresses the potential for impacts to water resources due to the proposed construction and operation of the GBI VOC test site at Clear AFS.

#### **Construction**

During the 2-year construction period, approximately 162 hectares (400 acres) of undisturbed land could be altered to accommodate the new facilities, which is roughly 3 percent of the total base. The proposed sites are currently forested and are used for recreation and open space. Due to the relatively level topography and low precipitation, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the distance between the construction site and surface water bodies. The proposed GBI VOC test site sites are not within the 100-year floodplain.

Detailed geotechnical studies would be conducted to determine the depth to groundwater relative to the total depth requirement for the GBI silos. Based on the defined groundwater depth of 17 to 20 meters (55 to 65 feet) below ground surface, the missile silos may need to be slightly elevated to avoid de-watering during construction and operation. Dewatering of the site during construction or operation would require authorization under a state-wide general permit. All construction and operation activities would be completed in accordance with state and Federal water resources regulation.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.1.5, Hazardous Materials and Hazardous Waste Management.

GBI construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit that would be filed with the EPA would also be provided to the ADEC. A copy of the SWPPP would also be provided to the ADEC. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the EPA and the ADEC.

The water requirements for the construction workforce in the region would be approximately 0.11 million liters per day (0.03 million gallons per day). As discussed under the utilities section, there is adequate water supply on base and within the region to meet this demand. There are currently no aquifer issues, and with a relatively minor increase in water use, these water requirements would not impact the water supply aquifer.

### **Operation**

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.1.5, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the GBI VOC test site facilities and would include the BMP that would be implemented for the proposed facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at GMD facilities.

As analyzed in the NMD Deployment EIS, the water requirements for operations would be approximately 0.05 million liters per day (0.01 million gallons per day), which represents less than 1 percent of the current water usage. These water requirements would result in

a total installation water usage of approximately 64 percent of the available water supply capacity.

#### **Cumulative Impacts**

No other future programs have been identified that, when combined with the Proposed Action, would contribute to cumulative water resources impacts. Although the use of the proposed facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-GBI VOC test site storm water runoff levels and quality so as not to contribute to cumulative impacts.

### **4.6.12 ENVIRONMENTAL JUSTICE**

This section addresses the potential environmental justice impacts due to construction and operation of the GBI VOC test site at Clear AFS.

#### **Construction and Operation**

There would be no disproportionately high and adverse environmental or human health effects on minority or low-income populations around Clear AFS.

#### **Cumulative Impacts**

No other projects or activities in the region have been identified that would contribute to potential cumulative environmental justice impacts.

## **4.7 CUMULATIVE IMPACTS**

GMD VOC Test Bed activities are proposed for a number of widely separated geographic areas. Consequently, there is little or no potential for cumulative impacts between the various Test Bed sites. Nor are any significant cumulative environmental impacts foreseen at Beale AFB, California or at any of the BMC2 sites in the Continental United States, since activities at these sites involve primarily interior modifications to existing facilities. The following discussion summarizes the potential for cumulative impacts between GMD VOC Test Bed activities at each of the primary sites and other activities in the same general area.

#### **Fort Greely, Alaska**

There may be some minor cumulative impacts to air quality from mobile sources and ground disturbing activities involved in the construction of new power lines from Richardson Highway to the Alascom Microwave site when combined with proposed activities at Fort Greely. However, any cumulative effects would be short-term due to the temporary nature of the construction activities. Ground disturbing activities would result in the loss of some vegetation and wildlife habitat. However, given the extent of similar habitat surrounding Fort Greely, there is very little potential for substantial cumulative impacts, when combined with past and potential future activities. Implementation of

measures during construction to reduce soil erosion and restoration of areas following ground disturbing activities would avoid any significant long-term cumulative impacts to soils or water quality from erosion. Hazardous materials use and hazardous waste generation is expected to increase at Fort Greely from the proposed activities and other existing activities and potential future activities but would not result in any cumulative adverse effect on area hazardous waste management. Since Fort Greely has previously sustained greater numbers of personnel than is anticipated from the proposed activities, no cumulative impacts on infrastructure requirements are anticipated. In conjunction with the construction of the new power line from the Richardson Highway to the Alascom Microwave Site, proposed GMD VOC Test Bed activities are expected to have a positive cumulative effect on the local economy.

#### **Eareckson AS, Shemya Island, Alaska**

Due to its isolated location, activities at Eareckson AS would not result in cumulative impacts with other activities elsewhere in the Aleutian Islands. The principal new activities proposed at Eareckson AS are related to the GMD VOC Test Bed. Some increase in air emissions from new energy sources is expected, and there will be a net loss of about 1 percent of Shemya Island's wetlands as a result of the proposed activities. The loss of wetlands will result in a small reduction of wildlife habitat on the island. Although there will be some increase in the generation of waste materials, including hazardous waste, during construction activities, operation of the GMD VOC facilities would not result in a significant increase in waste, and no cumulative long-term impacts to waste management are expected. The proposed activities include minor upgrades to existing infrastructure, which will preclude significant cumulative impacts to infrastructure, such as power, water, and wastewater capacity.

#### **Eielson AFB, Alaska**

Since the proposed Missile Transfer Facility at Eielson AFB would be built on a level, graveled site, only minimal new ground disturbance for access road improvements and utilities would occur. Temporary increases in air emissions, noise, and waste generation during construction activities would be reduced at the completion of the construction phase. If planned new military construction at Eielson AFB occurs during construction of the Missile Transfer Facility, there could be some cumulative increase in utility demands, which would be accommodated through construction-related utility systems. The potential for a cumulative increase in fire and safety risk during the operation of the Missile Transfer Facility would be minimized by the proposed activities being within an established explosive safety zone, which is cleared of nearby vegetation.

#### **Clear AFS, Alaska**

Clear AFS is located in the vicinity of Denali National Park, a Class 1 Prevention of Significant Deterioration area for air quality. However, temporary increases in air emissions during construction would not be expected to affect the PSD status of the Park. Construction of facilities on either site A or B would likely result in a net loss of 1 to 12 percent of wetlands, with more wetlands potentially affected at site B, resulting in a cumulative reduction of wetlands in the area. Construction and operation of GBI VOC facilities at Clear AFS would result in an increase in the use of hazardous materials and the

generation of hazardous waste. However, the increase would be well within the capacity of existing waste management systems and procedures, and no long-term cumulative impacts are expected. No future programs have been identified that would result in significant cumulative impacts to infrastructure or utility systems. Socioeconomic impacts would be mostly positive, with an increase of the workforce during construction, but is not expected to have a long-term cumulative effect on the economy of the area.

#### **Beale AFB, California**

Since proposed activities involve only interior modifications to the EWR building and hardware and software upgrades to the radar, the only potential impacts would be to cultural resources and health and safety. Consequently, there would be no cumulative impacts to air, water, or biological resources, and no change to existing infrastructure, such as wastewater, solid waste or utilities. Radiated power from the UEWR would remain unchanged and, consequently, would not involve any cumulative impacts to health and safety as a result of the hardware and software upgrades. Modifications to the interior of the EWR could, in conjunction with any other U.S. Air Force modifications, result in some minor cumulative impacts to the historic architectural integrity of the building, but this would be mitigated by appropriate recordation to preserve a historic record of the radar, in accordance with accepted practice.

### **4.8 ENVIRONMENTAL CONSEQUENCES OF THE NO-ACTION ALTERNATIVE**

If the No-action Alternative is selected, no environmental consequences associated with the GBI VOC test site facilities would occur. Present activities would continue with no change in current operations.

### **4.9 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED**

Adverse environmental effects that cannot be avoided include the release of small amounts of pollutants into the atmosphere and ocean; minor noise impacts on wildlife; short-term impact to vegetation from construction activities; minor increased generation of hazardous materials; and increased noise levels at program-related sites. However, through implementation of the program actions described within this document, these effects would be minimized. No significant individual or cumulative adverse environmental impacts are anticipated to result from the Proposed Action.

#### **4.10 CONFLICTS WITH FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA CONCERNED**

All of the proposed program activities would take place in existing facilities or locations on a DoD installation dedicated to training and testing activities. These activities would not alter the uses of the sites, which were in the past or currently are used to support training and testing activities. However, potential new training and testing areas within the range boundaries could be developed. No conflicts with land use plans, policies, and controls are anticipated.

#### **4.11 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL**

Anticipated energy requirements of the GBI VOC test site facilities program would be well within the energy supply capacity of all facilities. Energy requirements would be subject to any established energy conservation practices at each facility.

#### **4.12 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES**

The Proposed Action would result in no loss of threatened or endangered species, and no loss of cultural resources, such as archaeological or historic sites. Moreover, there would be no changes in land use or preclusion of development of underground mineral resources that were not already precluded.

The amount of materials required for any program-related activities and energy used during the project would be small. Although the proposed activities would result in some irreversible or irretrievable commitment of resources such as various metallic materials, minerals, and labor, this commitment of resources is not significantly different from that necessary for many other defense research and development programs carried out over the past several years. Proposed activities would not commit natural resources in significant quantities.

#### **4.13 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY**

Proposed GBI VOC test site activities would take advantage of existing facilities and infrastructure. The proposed upgrades to these facilities or locations would not alter the uses of the sites. Therefore, the Proposed Action does not eliminate any options for future use of the locations under consideration.

#### **4.14 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL**

Other than various structural materials and fuels, the program would require no significant natural or depletable resources.

#### **4.15 FEDERAL ACTIONS TO ADDRESS PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS (EXECUTIVE ORDER 13045)**

This EA has not identified any environmental health and safety risks that may disproportionately affect children, in compliance with Executive Order 13045.

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## **5.0**

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## 5.0 REFERENCES

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## **6.0**

### **LIST OF PREPARERS**

---

## 6.0 LIST OF PREPARERS

---

### Government Preparers

David Hasley, Environmental Engineer

U.S. Army Space and Missile Defense Command

B.S., 1984, Mechanical Engineering, University of Texas, Arlington

Years of Experience: 17

Vanessa M. Turner, Environmental Engineer

U.S. Army Space and Missile Defense Command

B.S., 1998, Civil Engineering, Southern University and A&M College, Baton Rouge, Louisiana

Years of Experience: 4

### Contractor Preparers

Karen Brandt, Environmental Specialist, EDAW, Inc.

B.A., 1975, San Diego State University

Years of Experience: 27

Matthew M. Estes, Environmental Specialist, EDAW, Inc.

M.S., 2000, Environmental Management, Samford University, Birmingham, Alabama

B.S., 1991, Environmental Science, University of California at Riverside

Years of Experience: 10

Sue M. Estes, Private Consultant

M.A., 1988, Public and Private Management, Birmingham-Southern College, Alabama

B.S., 1977, Business, University of Alabama, Tuscaloosa

Years of Experience: 12

Seon Farris, Environmental Engineer, Teledyne Solutions, Inc.

M.S.E., in progress, Environmental Engineering, University of Alabama in Huntsville

B.S., 1993, Chemical Engineering, Auburn University

Years of Experience: 6

Amy Fenton-McEniry, Technical Editor, EDAW, Inc.

B.S., 1988, Biology, University of Alabama in Huntsville

Years of Experience: 13

Rebecca J. Fitzsimmons, Environmental Planner 1, EDAW, Inc.  
B.S., 2000, Civil/Environmental Engineer, University of Alabama in Huntsville  
Years of Experience: 1

Jonathan Henson, Environmental Specialist, EDAW, Inc.  
B.S., 2000, Environmental Science, Auburn University  
Years of Experience: 1

Brittnea Horton, Environmental Specialist, EDAW, Inc.  
B.S., 2001, Geography and Biology, University of North Alabama  
Years of Experience: 1

Mark Hubbs, Environmental Analyst, Teledyne Solutions, Inc.  
M.S., 2000, Environmental Management, Samford University  
B.A., 1981, History, Henderson State University  
Years of Experience: 12

Rachel Y. Jordan, Environmental Scientist, EDAW, Inc.  
B.S., 1972, Biology, Christopher Newport College, Virginia  
Years of Experience: 13

Edd V. Joy, Senior Environmental Planner, EDAW, Inc.  
B.A., 1974, Geography, California State University, Northridge  
Years of Experience: 28

Ron Keglovits, Environmental Management Analyst, Teledyne Solutions Inc.  
M.A., 1982, Management, Webster College  
B.A., 1976, Business Management, St. Martin's College  
Years of Experience: 15

Brandon Krause, Technical Illustrator, EDAW, Inc.  
B.S., Computer Engineering, in progress, University of Alabama in Huntsville  
Years of Experience: 1

David L. McIntyre, Environmental Specialist, EDAW, Inc.  
M.A., 2000, Geography, San Diego State University  
M.S., 1997, Environmental Management, National University, San Diego  
B.S., 1990, History, United States Naval Academy  
Years of Experience: 2

Rickie D. Moon, Senior System Engineer Teledyne Solutions, Inc.  
M.S., 1997, Environmental Management, Samford University  
B.S., 1977, Chemistry and Mathematics, Samford University  
Years of Experience: 14

Wesley S. Norris, Senior Environmental Planner  
EDAW, Inc.  
B.S., 1976, Geology, Northern Arizona University  
Years of Experience: 23

Steve Scott, Geologist, EDAW, Inc.  
B.S., 1973, Geology, California State University, San Diego  
Years of Experience: 29

William Sims, Geographic Information Services Specialist, EDAW, Inc.  
B.S., 1993, Geography, University of North Alabama  
Years of Experience: 7

Lori Stephan, Environmental Engineer, Morgan Research Corp.  
B.S., 1999, Biology, University of Alabama-Huntsville  
Years of Experience: 2

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## **7.0**

### **AGENCIES AND INDIVIDUALS CONTACTED**

---

## 7.0 AGENCIES AND INDIVIDUALS CONTACTED

---

### Beale Air Force Base

Joni Jerry, Cultural Resource Manager

### Elmendorf Air Force Base

James W. Hostman, Environmental Engineer  
611 CES/CEVP, Elmendorf AFB AK

Fred Walter, Environmental Engineer  
611 CES/CEVP, Elmendorf AFB AK

### Fort Greely

Susan Moniz, Environmental Manager

### Fort Wainwright

Ken Spiers, Environmental Manager

### Hanscomb Air Force Base

Mr. Jim O'Leary, ECS

### Alvin G. Ott, Regional Supervisor

Habitat and Restoration Division  
State of Alaska Department of Fish and Game

### Larry K. Bright, Acting Field Supervisor

Northern Alaska Ecological Services  
Fish and Wildlife Service

### Dick Mylius

Alaska Department of Natural Resources

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## **APPENDIX A**

### **DISTRIBUTION LIST**

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# APPENDIX A

## DISTRIBUTION LIST

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### FEDERAL

611<sup>th</sup> ASG/CRMD (Col Charles Lambert)

611<sup>th</sup> ASUS/PME

611<sup>th</sup> CES/CEVP (Mr. Jim Hostman)

AF ESC (Mr. Jim O'Leary)

MDA/GC (LTC Karen Judkins)

MDA/TERC (Mr. Crate Spears)

Eielson AFB

Elmendorf PAO (Colonel Charles Lambert)

Fort Greely (Ms. Joyce Duff)

Fort Richardson (Mr. Doug Johnson)

GMT-G (Mrs. Vicky Cody)

JNB (Mr. Martin Horechny, Mr. Carlton  
Brewer, Mr. Mike Trowse)

GMS-A (Mr. Pat Coullahan and Mr. Chris  
Turletes)

GMS-E (Mr. Eric Sorrells)

JND-A Safety (Mr. Ken Messerich)

JNG-S-S (Mr. Phil Watson)

GME-H (Mrs. Katy Attilio)

JNT-TE (Mrs. Patricia Gore)

National Guard Armory, State Coordinator  
ATTN: Mr. Chris Nelson

GMD Prime (Mr. Jim Quinn, Ms. Jean  
Downs)

SMDC (Mr. Randy Gallien, Mr. David  
Hasley, Ms. Vanessa Turner, Ms. Julia  
Hudson-Elliott, Mr. Steve Donnelly)

USACE HSV (Ms. Lori Mullins)

DISA (Mr. Robert Laskey)

### ELECTED OFFICIALS

The Honorable Tony Knowles  
Governor of Alaska  
Juneau, AK

The Honorable Roy Gilbertson  
Mayor of Delta Junction  
Delta Junction, AK

The Honorable John Gonzales  
Mayor of the Denali Borough  
Healy, AK

The Honorable James C. Hayes  
Mayor  
Fairbanks, AK

The Honorable Henry Hove  
Mayor of the North Star Borough  
Fairbanks, AK

The Honorable Jeffery James Jacobson  
Mayor of North Pole  
North Pole, AK

The Honorable Richard Napoleone  
Mayor of Anderson  
Anderson, AK

The Honorable Bob Barkhouse  
Mayor of Yuba City  
Yuba City, CA

The Honorable Roy V. Crabtree  
Mayor of Wheatland  
Wheatland, CA

The Honorable Jerry Crippen  
Mayor of Marysville  
Marysville, CA

The Honorable Cathy Sands  
Mayor of Auburn  
Auburn, CA

Mr. Chris Nelson  
Legislative Information Office  
Anchorage, AK

## **CONTRACTOR**

Teledyne Solutions, Inc. (Mr. Warren  
Martin, Mr. Ron Keglovitz)

## **AGENCIES**

Mr. Rick Albright  
U.S. Environmental Protection Agency  
Alaska Operations Office  
Anchorage, AK

Mr. Greg Ballogh  
U.S. Fish and Wildlife Service  
Anchorage Ecological Services Office  
Anchorage, AK

Mr. Robert D. Barbee, Regional Director  
U.S. Department of the Interior  
National Park Service  
AK Area Field Office  
Anchorage, AK

Mr. Chuck Bell, State Conservationist  
U.S. Department of Agriculture  
Natural Resource Conservation Service  
Alaska State Office  
Anchorage, AK

Ms. Judith E. Bittner  
State Historic Preservation Officer  
Alaska Department of Natural Resources  
Office of History and Archaeology  
Division of Parks and Outdoor Recreation  
Anchorage, AK

Mr. Rex Blazer  
Alaska Office of Management and Budget  
Division of Governmental Coordination  
Juneau, AK

Ms. Michele Brown, Commissioner  
Alaska Department of Environmental  
Conservation  
Juneau, AK

Mr. Samuel Demientieff  
Fairbanks Agency  
Bureau of Indian Affairs  
Federal Building & Courthouse  
Fairbanks, AK

Ms. Linda Douglass  
Public Affairs Office  
Fort Wainwright, AK

Mr. Gary Forman  
U.S. Bureau of Land Management  
Fairbanks, AK

Mr. Clarence Goward  
FAA Anchorage  
Anchorage, AK

Ms. Jeanne L. Hanson  
Field Office Supervisor for Habitat  
Conservation  
U.S. Department of Commerce  
National Marine Fisheries Service  
Anchorage, AK

Mr. Kevin Harun, Executive Director  
Alaska Center for the Environment  
Anchorage, AK

Adelheid Herrmann  
Alaska Regional Coordinator  
Native American Fish and Wildlife Society  
Anchorage, AK

Mr. Jeff Hughes  
Alaska Department of Fish and Game  
Division of Wildlife Conservation, Region 2  
Anchorage, AK

Mr. Douglas W. Johnson  
US Army Alaska  
Fort Richardson, AK

Mr. Albert Kahklen  
Anchorage Agency  
Bureau of Indian Affairs  
Anchorage, AK

Mr. Ronald G. King  
Chief, Alaska Department of  
Environmental Conservation  
Division of Air and Water Quality  
Air Quality Improvement Section  
Fairbanks, AK

Mr. William D. McGee  
Regional Environmental Supervisor  
Alaska Department of Environmental  
Conservation  
Fairbanks, AK

Mr. Ervin McIntosh  
Field Supervisor  
U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
Ecological Service/Fairbanks  
Fairbanks, AK

Mr. Leo Morgan  
Executive Director  
Alaska Native Health Board  
Anchorage, AK

Mr. Alvin G. Ott  
Regional Supervisor  
Alaska Department of Fish and Game  
Region III  
Habitat Protection Division  
Fairbanks, AK

Mr. Steven Pennoyer  
Regional Administrator  
U.S. Department of Commerce  
National Marine Fisheries Service  
Alaska Regional Office  
Juneau, AK

Mr. Wally Powers  
Fairbanks North Star Borough  
Fairbanks, AK

Mr. John Stone  
Chief, Alaska Department of  
Environmental Conservation  
Division of Air and Water Quality  
Air Quality Maintenance Section  
Fairbanks, AK

Greg Siekaniec  
U.S. Department of Interior  
Alaska Maritime National Wildlife Refuge  
Homer, AK

Ms. Nancy Welch, Regional Manager  
Alaska Department of Natural Resources

Division of Land and Water Management  
Northern Regional Office  
Fairbanks, AK

Mr. Everett Robinson Wilson  
U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
Aleutian Ecological Services  
Region 7  
Anchorage, AK

Mr. Curt Wilson  
U.S. Bureau of Land Management  
Anchorage, AK

US Dept of Agriculture  
Rural Utilities Service  
Northern Regional Division  
ATTN: Nurul Islam/Charlie Philpott  
STOP 1566  
1400 Independence Avenue, SW  
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## **LIBRARIES**

Alaska Resources Library and Information  
Services  
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Delta Junction Library  
Delta Junction, AK

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Public Library  
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Fairbanks, AK

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Kodiak, AK

Beale Air Force Base  
Military Library  
Marysville, CA

Barbo Branch Library  
Live Oak, CA

Sutter County Library  
Yuba City, CA

Yuba City Library  
Marysville, CA

Yuba College Library  
Yuba College  
Marysville, CA

Coast Guard/MWR Library  
Attn: Librarian  
Air Station Cape Cod, MA

Cape Cod Community College Library  
Librarian West Barnstable, MA

Sandwich Public Library  
Reference section  
Sandwich, MA

Falmouth Public Library  
Reference Section  
Falmouth, MA

Mashpee Public Library  
Mashpee, MA

### **REGIONALLY AFFILIATED CULTURAL GROUPS**

Ms. Evelyn Beeter  
Executive Director  
ML Sanford Tribal Consortium  
Gakona, AK

Mr. Jack Carpenter  
President and CEO  
Bering Straits Native Corp.  
Nome, AK

Ms. Nora David  
First Chief  
Mentasta Traditional Council  
Mentasta Lake, AK

Ms. Diana Ervin  
Tanana Chiefs Conference, Inc.  
Tok, AK

Terry Hoeffler  
Bristol Bay Native Association  
Dillingham, AK

Mr. Jerry Isaac  
Executive Director  
Native Village of Tanacross (IRA)  
Tanacross, AK

Mr. Ken Johns  
President  
Copper River Native Association  
Copper Center, AK

Mr. Fred Kirsteatter  
President, Healy Lake Village  
Fairbanks, AK

Mr. Fore Lekanof  
Aleutian-Pribilof Island Assoc.  
Director of Comm. Services Anchorage,  
AK

Mr. Bentley Mark, Sr.  
President  
Native Village of Tetlin (IRA)  
Tetlin, AK

Ms. Margaret Mathews  
Tanana Chiefs Conference  
Fairbanks, AK

Mr. Leo Morgan  
Executive Director  
Kuskokwim Native Association  
Aniak, AK

Ms. Veronica Nicholas  
President  
Native Village of Cantwell  
Cantwell, AK

Mr. Hjalmar Olson  
President and CEO  
Bristol Bay Native Corporation  
Anchorage, AK

Ms. Gloria O'Neill  
Acting Executive Director  
Cook Inlet Tribal Council, Inc.  
Anchorage, AK

Mr. Moses Paul  
Chief  
Nenana Native Association  
Nenana, AK

Mr. John Regitano  
Executive Director

Fairbanks Native Association  
Fairbanks, AK

Mr. Berkman Silas  
Chief  
Native Village of Minto (IRA)  
Minto, AK

Ms. Rita Stevens  
President  
Kodiak Area Native Association  
Kodiak, AK

Ms. Nellie Vale  
Director  
Yakutat Native Association  
Yakutat, AK

#### **OTHER**

Mr. Joel Bennett  
Alaska Representative  
Defenders of Wildlife  
Alaska Office  
Juneau, AK

Mr. Ross Coen  
Wilderness Campaign Coordinator  
Northern Alaska Environmental Center  
Fairbanks, AK

Ms. Janet Daniels  
Military Toxics Project

Delta Greely Community Coalition

Ms. Melanie Duchin  
GreenPeace Alaska  
Anchorage, AK

Mr. Kevin Harun  
Executive Director  
Alaska Center for the Environment  
Anchorage, AK

Ms. Sally Kabisch  
Field Representative  
Sierra Club, Alaska Field Office  
Anchorage, AK

B. Long  
Global Issues

Ms. Pamela Miller  
Alaska Community Action on Toxics

Mr. Steven Haagenon  
Golden Valley Electric Assn

Mr. Allen E. Smith  
The Wilderness Society  
Anchorage, AK

Ms. Ann Winter  
Institute of the North

Physicians for Social Responsibility  
Washington, D.C.

Greenpeace  
Washington, D.C.

Alaska Action Center  
Anchorage, AK

Alaska Community Action on Toxics  
Anchorage, AK

Alaska Public Interest Research Group  
Anchorage, AK

Kodiak Rocket Launch Information Group  
Kodiak, AK

No Nukes North: Alaskan & Circumpolar  
Coalition Against Missile Defense  
Fairbanks, AK

Mr. Bruce K. Gagnon  
Global Network

Mr. Michael Jones  
University of Hawaii  
Department of Physics and Astronomy  
Honolulu, HI

Mashpee Environmental Coalition  
Mashpee, MA

Richard and Sharon Judge  
Cape Cod Coalition to Decommission  
PAVE PAWS

Mr. David Adelman  
Natural Resources Defense Counsel

Mr. Daryl G. Kimball  
Coalition to Reduce Nuclear Dangers

Ms. Ellen Thomas  
Proposition One Committee

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## **APPENDIX B**

## **CORRESPONDENCE**

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# STATE OF ALASKA

## DEPARTMENT OF FISH AND GAME

### HABITAT & RESTORATION DIVISION

TONY KNOWLES, GOVERNOR

1300 COLLEGE ROAD  
FAIRBANKS, ALASKA 99701-1599  
PHONE: (907) 459-7289  
FAX: (907) 456-3091

January 30, 2002

Commander, U.S. Army Space and Missile Defense Command  
Attention: SMDC-EN-V – Mr. David Hasley  
P.O. Box 1500  
Huntsville, AL 35807-3801

Dear Mr. Hasley:

RE: Ground-Based Midcourse Defense Validation of Deployment Concept, Draft  
Environmental Assessment

The Alaska Department of Fish and Game (ADF&G), Habitat and Restoration Division has reviewed the above referenced EA dated 7 January 2002 and have the following comments:

Section 3.3.2 Biology - Eielson AFB (page 3-47, line 26)

*Wildlife* – French Creek supports spawning and rearing chum salmon, Piledriver Slough supports migrating (possibly) spawning chum salmon. ADF&G's "Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes" does not identify chinook (king) salmon in these waterbodies. In addition, French Creek and Piledriver Slough support resident fish, e.g., Arctic grayling, whitefish, longnose suckers, and pike.

Section 3.6.2 Biological Resources - Clear AFS (page 3-65, line 21)

*Wildlife* – The Nenana River forms the west boundary of Clear AFS and is designated an anadromous stream. This portion of the Nenana River supports chinook, coho, and chum salmon (migration) along with resident fish (e.g., Arctic grayling, whitefish, pike). Coho salmon spawning areas have been documented approximately 3 miles downstream on the Nenana River. Lost Slough (branches off of the Nenana River at the northwest corner of the boundary) and many of its tributaries are documented as spawning areas for chinook, coho, and chum salmon.

Section 3.6.7 INFRASTRUCTURE -Clear AFS (page 3-74, line 35)

*Wastewater* – For many years, state agencies have had concerns regarding the unwanted goldfish (domestic fish released into the system) that reside in the power plant, cooling pond, discharge ditch, and Lake Sansing. The ADF&G has

Mr. David Hasley  
GMD EA

2

January 30, 2002

offered to assist the U.S. Air Force in eradicating the goldfish, but as far as we know, the problem still exists. The ADF&G feels that unless we completely remove all goldfish from the power plant system, the possibility remains for unauthorized release of these fish into waters of the Nenana River drainage.

Thank you for the opportunity to comment. If you have any questions concerning the above comments, please contact Nancy Ihlenfeldt at (907) 459-7287 or email: [nancy\\_ihlenfeldt-mcnay@fishgame.state.ak.us](mailto:nancy_ihlenfeldt-mcnay@fishgame.state.ak.us).

Sincerely,



Alvin G. Ott, Regional Supervisor  
Habitat and Restoration Division

cc: Larry Bright, USFWS, Fairbanks

AGO/nji



United States Department of the Interior  
Fish and Wildlife Service  
NORTHERN ALASKA ECOLOGICAL SERVICES  
101 12th Ave., Box 19, Room 110  
Fairbanks, Alaska 99701  
February 12, 2002



Commander  
U.S. Army Space and Missile Defense Command  
Attention: SMDC-EN-V, Mr. David Hasley  
P.O. Box 1500  
Huntsville, AL 35807-3801

Re: Ground-based Midcourse Defense  
Validation of Deployment Concept  
Draft Environmental Assessment

Dear Mr. Hasley:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Ground-Based Midcourse Defense (GMD) Validation of Deployment Concept (VDC) Environmental Assessment (EA). The EA analyzes activities designed to validate GMD deployment, including construction techniques, operational procedures, installation, checkout, assembly, and maintenance. The preferred alternative includes construction and operation of the following: 5 ground-based interceptor (GBI) silos and supporting facilities at Fort Greely, Alaska; command and control facilities, which include interceptor communication system data terminals, defense satellite communication system earth terminals, and fiber optic cable at Fort Greely and Eareckson Air Station (AS), Alaska; and a missile transfer facility at Eielson Air Force Base (AFB), Alaska.

According to the EA, construction and operation components of the GMD will occur in previously disturbed areas at Fort Greely, Eareckson AS and Eielson AFB. This will most likely result in less impact to fish and wildlife resources. Communication towers and power lines could pose significant threats to some species of birds. Bright lights on towers and other tall structures may attract or confuse migrating birds under certain conditions. The final EA should address efforts to avoid, minimize, and mitigate impacts to fish and wildlife resources, with particular emphasis on minimizing the potential of bird strike. The Service is ready to work with the Army on specific design criteria.

The Biological Resources section (3.2.3) of the EA addresses threatened and endangered species in the area of Eareckson AS and waters surrounding Shemya Island. In Table 3-1, "Sensitive Species with Federal or State Status Under the Endangered Species Act Potentially Occurring in the Project Areas," please add the Aleutian Islands population of northern sea otter (*Enhydra lutris kenyoni*), which is now a Candidate Species and may be proposed for listing under the Endangered Species Act (ESA) in the near future. In Table 3-1 and in the text of Section 3.2.3 (page 3-31 line 24), spectacled eiders are mentioned as being observed during the winter months.

It is highly unlikely that spectacled eiders would be observed offshore of Shemya Island. Furthermore, on page 3-31, lines 18 and 19, the short-tailed albatross is discussed as a candidate species. This species is now listed as endangered in U.S. territorial waters (Gulf of Alaska, Aleutian Islands, Bering Sea Coast) as well as Japan, Russia and the high seas.

There are no threatened or endangered species at Fort Greely or Eielson AFB. The proposed project sites are within the range of the American peregrine falcon (*Falco peregrinus anatum*), which was removed from the list of threatened and endangered species on August 25, 1999. Although American peregrines are no longer protected under the ESA, we still work with applicants and agencies to avoid impacts to peregrine falcons to assure a healthy long-term population. As long as construction and operation components of the GMD are restricted to previously disturbed areas at Fort Greely and Eielson AFB, the Service believes the proposed project and associated activities are not likely to adversely affect peregrine falcons. However, as construction plans become more specific, we recommend that you contact us so we can compare known nesting sites to construction plans. If any nest sites are near construction projects, we can offer technical advice to minimize impacts.

This letter constitutes informal consultation under the Endangered Species Act. Preparation of a Biological Assessment or further consultation regarding this project is not necessary at this time. If project plans change or listed species are observed on the project site, consultation should be reinitiated by your agency.

We appreciate the opportunity to comment. Please contact Elaine Gross at 456-0209 with any new information on this project, or if you have questions regarding these comments.

Sincerely,

  
Larry K. Bright  
Acting Field Supervisor

ESG/esg

cc: Jeff Williams, Alaska Maritime NWR - Aleutian Islands Unit  
Greg Siekaniec, Refuge Manager, Alaska Maritime NWR  
Greg Balough, WAES, Anchorage

# STATE OF ALASKA

## DEPT. OF ENVIRONMENTAL CONSERVATION DIVISION OF AIR AND WATER QUALITY AIR PERMITS PROGRAM

TONY KNOWLES, GOVERNOR

410 Willoughby Avenue, Suite 303  
Juneau, AK 99801-1793  
PHONE: (907) 465-5100  
FAX: (907) 465-5129  
TDD/TTY: (907) 465-5040  
<http://www.state.ak.us/dec/>

February 12, 2002

Thomas M. Devanney  
Deputy System Program Director  
Ground-Based Midcourse Defense  
Joint Program Office  
P.O. Box 1500  
Huntsville, AL 35807

Certified Mail No.: 7000 0520 0025 2110 3039  
Return Receipt Requested

Subject: Permit applicability for the proposed emission sources at the Ground Based Midcourse Defense (GMD) Deployment Concept Validation Test Bed at Eareckson Air Station.

Dear Mr. Devanney:

We have reviewed your letter dated January 14, 2002 regarding the permit applicability for the proposed GMD Deployment Concept Validation Test Bed (GMD Test Bed) at Eareckson Air Station. GMD Test Bed is a new facility under the control of the Ballistic Missile Defense Organization (BMDO), under separate control from the U.S. Air Force. Based on EPA's guidance for Major Source Determinations for Military Installations, GMD Test Bed is considered a separate facility for air permitting purposes. GMD Test Bed is proposing to install the following emission sources with annual facility emissions estimated in Table 1.

- Twelve 60-kilowatt micro turbines at the Defense Satellite Communication Systems (DSCS) facility
- Two 4,000 gallon above ground storage tanks (AST) at the DSCS facility
- One 2.35 million gallon AST
- One 250 kW emergency generator at the IDT facility
- One 1,050 gallon AST at the IDT facility

Table 1: GMD Test Bed Emissions at Eareckson Air Station

Facility	Source	CO <sub>2</sub> (lb/hr)	CO (lb/hr)	NO <sub>x</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	PM <sub>10</sub> (lb/hr)	PM <sub>2.5</sub> (lb/hr)
Above ground storage tank	2.35 million gal				1.8	0.08	
Emergency generator	250 KW	45.5	3.0	9.8	3.2	3.7	0.04
Above ground storage tank	1,050 gal				0.1	0.00	
Emergency communication	12 x 60 KW	6.0	15.4	50.4	0.1	18.6	0.12
Above ground storage tank	2 x 4,000 gal				0.4	0.02	
Above ground storage tank	2 x 4,000 gal				0.1	0.00	
Facility totals		51.5	18.4	60.2	3.3	24.7	0.26

GMD Concept Validation Test Bed, Eareckson Air Station

February 12, 2016

The proposed facility does not have fuel-burning equipment with a rated capacity of more than 50 million Btu per hour and does not have sources subject to standards set by 18 AAC 50.055(a)(5), (a)(7) or (d). The facility does not have the potential to violate one or more of the ambient air quality standards as set out in 18 AAC 50.300(b) and is not subject to any other classification as set out in 18 AAC 50.300, and as such does not require a construction permit.

If you have any further questions, please contact Zeena Siddeek at (907) 465-5303.

Sincerely,

  
Jim Baumgartner  
Supervisor, Construction Permits

cc: Bob Cannone, AWQ Air Permits Fairbanks  
Rex Blazer/DGC, Juneau  
Mary Siroky/SPS, DEC, Juneau

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## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Alaska Maritime National Wildlife Refuge  
2355 Kachemak Bay Drive, Suite 101  
Homer, Alaska 99603-8021

IN REPLY REFER TO:

March 4, 2002

Commander  
U.S. Army Space and Missile Defense Command  
Attn: SMDC-EN-V (Mr. David Hasley)  
P.O. Box 1500  
Huntsville, AL 35807-3801

Dear Sir:

The following comments are offered in response to your Coordinating Draft Environmental Assessment on the Ground-based Midcourse Defense and Validation of Deployment Concept issued on 7 January 2002. All the comments here apply to Eareckson AS at Shemya only.

### General Comments

1. The environmental restoration section should be expanded to include a discussion on what steps will be taken to remediate facilities when the project is ultimately abandoned.
2. There does not seem to be any discussion of the fiber optics cable shown in Fig. 2.6. If the cable is a part of this project, the impacts of bringing it ashore through the shallow subtidal and intertidal zones needs to be discussed. These are particularly important habitats for marine resources.
3. Your preparers did not find any of the references for biological resources and few for cultural resources that could have made the description of affected environment much better.

### Specific Comments

1. Page es-5, lines 31-33. This is a place to refer to the draft Memorandum of Understanding between the Air Force and the Alaska Maritime National Wildlife Refuge. Point out that Shemya is part of the refuge and that construction and operation of the facilities will include mitigation of impacts on biological resources.
2. Page 2-19, section 2.2.3.5. If it is determined that a man camp is needed at Eareckson, a site should be picked that minimizes the damage to Empetrum nigrum, the main food source for Aleutian Canada geese in fall. The geese pose a hazard to aircraft if they stage near the runway, but when berry production of Empetrum is good, as it was in 2002, the geese remain in the uplands away from the runway and the bird air strike hazard is reduced significantly.

3. Page 3-1, lines 4-5. It probably is not true that the "information provided serves as a baseline from which to identify and evaluate environmental changes resulting from construction and operation of the components of the proposed GBI VDC test site. To provide a baseline point of reference for understanding any potential impacts..." If you intend to do this, a good deal more site specific survey data would be needed at least for the biological resources. I suggest you omit the statements as they are misleading. You are identifying areas where impact might occur, but you are not providing baseline from which change may be assessed at any useful scale.

4. Page 3-27, line 33. Clarification is needed. The section referred to applies only to Fort Greely.

5. Page 3-27, line 35-36. To acknowledge that the ROI includes important wildlife habitats, the paragraph might read, "The ROI for biological resources includes the area within and adjacent to the Proposed Action sites on Eareckson AS and other important wildlife areas on the surrounding Alaska Maritime NWR that could potentially be affected..."

6. Page 3-28, Vegetation section. You should use terms from the National Vegetation Classification System to describe the vegetation. You suggest that there are only two "associations" on Shemya, beach grass (whatever that is) and "remnants of crowberry tundra". To be helpful in planning, a map of the distribution of the crowberry would be helpful.

You may be correct that there is eelgrass, but please check this. We did not know it was present. Referencing the information sources would be helpful.

7. Page 3-28, Wildlife Section. This section is poorly written. There is no treatment of fish at Shemya only a statement about what is not there compared to elsewhere in the Near Islands. The second paragraph should include a better treatment of introductions, not just foxes but deer-mice and rats as well. The statement that there are no native terrestrial insects is erroneous.

In the second paragraph, it could be pointed out that Shemya is visited in migration by a high diversity of birds from North America and Asia (refer to the primary literature here).

Line 30, Glaucous-winged gulls are found at Shemya year around, a few nesting on offshore islets, but hundreds feeding in the intertidal zone. The reference to gulls on the runway is not helpful unless you want to talk about all the other species that also occur on the runway.

The emperor goose is not confined to the north shore. If you check some of the Legacy reports that the Air Force funded, you could do a useful summary of numbers and seasonal occurrence of all these species. Emperors, common eiders, and harlequins each number in the hundreds in winter and they use the intertidal and shallow subtidal zones around most of the island along with at least a dozen other species of marine birds.

Asiatic birds including waterfowl, shorebirds, raptors, and songbirds use much of the island not just the north shore bluffs.

8. Page 3-30. Sea otters occur on the north shore as well. There are counts of otters and seals in the Legacy reports and otters should be better described here since they are a candidate for listing under the Endangered Species Act. There is a recent decline. Your statement about trends is dated.

Threatened and Endangered Species: Check the accuracy of Distribution in Table 3-1.

Your preparers may be correct, but the occurrence of bowheads, fins, humpbacks, and right whales near Shemya should be reviewed and supported by primary literature references. As far as I know, Spectacled eiders do not normally occur at Shemya, much less so frequently as to be able to specify the water depth they occupy. Short-tailed albatrosses probably do occur in nearshore waters at Shemya periodically. They are perhaps more likely than some of the whales identified. Aleutian Canada geese visit Shemya from April through June not May through June. Steller sea lions are endangered under federal law, not threatened.

9. Page 3-31, Line 14-15. Some geese remain on Shemya overnight.

Lines 15-17. Shemya is not suitable for nesting recovery efforts because removal of foxes would increase bird populations and therefore increase hazards to aircraft.

Line 21. Short-tailed albatrosses probably occur in low numbers near Shemya annually.

Lines 24-27. Leave out discussion about spectacled eider. Leave out nesting area for Steller's eider since you don't add that for albatrosses or Aleutian Canada geese. Steller's eiders probably winter annually in low numbers in nearshore marine waters in the western Aleutians and are seen at Shemya occasionally.

10. Page 3-32. Lines 12-13. Move to beginning of section.

11. Page 3-37. Hazardous Materials Section

Chronic low-level oiling of Shemya beaches has been documented over the past decade (Byrd et al. 1995). The source of the oil is unknown, but it appears to be crude or diesel. Emperor geese and glaucous-winged gulls have been observed with oiled feathers and other species probably also are affected.

12. Page 4-38. Vegetation: add to last sentence (line 8) "except for the loss of Empetrum nigrum, an important fall food for Aleutian Canada geese. Loss of this food might cause geese to shift their feeding distribution to nearer the runway and increase the hazard to aircraft."

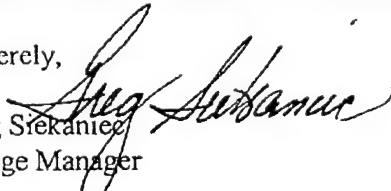
Wildlife: add the paragraph: "The movement of equipment and materials to Shemya during construction and operation of the project will increase the probability of introducing invasive species to the island. Care must be taken to prevent the introduction of Norway rats, other rodents, or invasive plants."

Lines 25-26. This is unclear? Of course the refuge encourages maintaining vegetation on the island. Are you referring to some sort of vegetation management?

Sensitive habitats: Refer to Empetrum here and maybe the sensitive intertidal areas and nearshore islands used by nesting seabirds and marine mammals.

Please feel free to contact me if clarification on any of the comments is needed.

Sincerely,

  
Greg Stokanice  
Refuge Manager

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## **APPENDIX C**

# **COASTAL CONSISTENCY DETERMINATION**

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**COASTAL CONSISTENCY DETERMINATION FOR  
GROUND-BASED MIDCOURSE DEFENSE  
VALIDATION OF OPERATIONAL CONCEPT ACTIVITIES  
ON EARECKSON AIR STATION (SHEMYA ISLAND), ALASKA**

## **INTRODUCTION**

The Coastal Zone Management Act of 1972, as amended, states that each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved coastal management programs.

The Alaska Coastal Management Act of 1977, as amended, and the subsequent Alaska Coastal Management Program set forth policy, guidelines, and standards to be used for the review of projects. The state's coastal management districts develop more specific policies for specific sections of Alaska's coast. Once approved by the state and the Federal government, the district programs become an integral part of the Alaska Coastal Management Program.

The Missile Defense Agency (MDA), formerly known as the Ballistic Missile Defense Organization, is responsible for developing and testing the Ballistic Missile Defense System (BMDS). One of the elements of BMDS under development is the Ground-Based Midcourse Defense (GMD), formerly known as the National Missile Defense System. The element of the BMDS program referred to in this document is the GMD Validation of Operational Concept (VOC) Test Bed program. Planned activities for the GMD VOC Test Bed on Eareckson AS include the construction and operation of six Aboveground Fuel Storage Tanks, one In-Flight Communications System (IFICS) Data Terminal (IDT) and communications network support facilities that include one Defense Satellite Communications System (DSCS) facility (with two antennas) and installation of terrestrial fiber optic cable (FOC). Other VOC activities involve Cobra Dane Radar hardware and software upgrades and associated facility modifications and refurbishment of the existing Air Force Power Plant. The appropriate Federal, state, and local environmental permits will be obtained prior to the start of construction. These permits include wetlands, water quality, and air quality.

The Alaska Coastal Management Program identifies 12 primary categories that are to be used in the consistency determination: coastal development; subsistence; recreation; energy facilities; transportation and utilities; fish and seafood processing; timber harvest and processing; mining and mineral processing; geophysical hazard areas; habitats; air, land, and water quality; and historic, prehistoric, and archaeological resources. It has been determined that the construction and operation of the GMD VOC Test Bed system is consistent to the maximum extent practicable with the Alaska Coastal Management Program. Appendix A evaluates the consistency of the GMD VOC Test Bed program with the requirements of each of the categories noted above. Appendix B evaluates the consistency with the local district policies.

The remainder of this document provides more detailed information on GMD VOC Test Bed program activities and the environmental consequences. A detailed description and other supporting documentation are contained in the Coastal Project Questionnaire (CPQ) & Certification Statement submitted to the Alaska Department of Governmental Coordination in September 2001.

## APPENDIX A

### EVALUATION OF ALASKA COASTAL MANAGEMENT STANDARDS FOR THE GROUND-BASED MIDCOURSE DEFENSE VOC ACTIVITIES AT EARECKSON AIR STATION, SHEMA ISLAND, AK

#### 6 AAC 80.040 COASTAL DEVELOPMENT

Districts and state agencies planning for and approving development in coastal areas shall give priority in the following order to:

- (1) water-dependent uses and activities;
- (2) water-related uses and activities; and
- (3) uses and activities that are neither water-dependent nor water-related for which there is no feasible and prudent inland alternative to meet the public need for the use or activity.

1. Is the activity located in a freshwater or saltwater shoreline? **No, the activities would occur on the inland parts of the island.**
2. Is the activity water-dependent or water-related? **No**

#### Evaluation

**No planned GMD VOC Test Bed activities would occur in a freshwater or saltwater shoreline. Materials will be brought in by barge and off loaded at the existing barge landing area and/or dock.**

#### 6 AAC 80.050 GEOPHYSICAL HAZARD AREAS

- (a) District and state agencies shall identify known geophysical hazards areas and areas of high development potential in which there is a substantial possibility that a geophysical hazard may occur.
- (b) Development in areas identified under (a) of this section may not be approved by appropriate state or local authority until siting, design, and construction measures for minimizing property damage and protecting against loss of life have been provided.

1. Is this activity located in a geophysical hazard area? **Yes**
- a. If yes, what measures have been taken to minimize property damage and protect against the loss of life?

### Evaluation

Shemya Island is in seismic zone 4 and is subject to a high probability of severe earthquake ground shaking during the life of the GMD elements. The IFICS Data Terminal and DSCS would be designed and constructed taking into account seismic and wind conditions found on Shemya Island.

## **6 AAC 80.060 RECREATION**

- (a) Districts shall designate areas for recreational use. Criteria for designation of areas of recreational use area:
- (1) the area receives significant use by persons engaging in recreational pursuits or is a major tourist destination; or
  - (2) the area has potential for high quality recreational use because of physical, biological, or cultural features.
- (b) District and state agencies shall give high priority to maintaining and, where appropriate, increasing public access to coastal waters.
1. Is the activity within a designated recreation area? **No**
  2. Does the activity negatively affect public access to coastal waters? **No**

### Evaluation

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD VOC Test Bed system would not impact any areas in which public recreation could occur.

## **6 AAC 80.080 TRANSPORTATION AND UTILITIES**

- (a) Transportation and utility routes and facilities in the coastal area must be sited, designed, and constructed so as to be compatible with district programs.
- (b) Transportation and utility routes and facilities must be sited inland from beaches and shorelines unless the route or facility is water-dependent or no feasible and prudent inland alternative exists to meet the public need for the route or facility.
1. Have you contacted the coastal district where the project will be located? **Yes**
  2. Are transportation and utility routes and facilities sited inland from beaches or shorelines? **Yes**
    - If no, is the route or facility water-dependent?
    - If no, please explain how the activity is consistent with this standard:

### Evaluation

Existing transportation and utility routes will be used to the maximum extent possible. New inland utility routes will be required for the IDT and DSCS. The terrestrial FOC will follow existing roadways to the maximum extent possible.

## **6 AAC 80.100 TIMBER AND HARVEST PROCESSING**

AS 41.17 Forest Resources and Practices, and the regulations and procedures adopted under that chapter with respect to the harvest and processing of timber, are incorporated into the Alaska coastal management program and constitute the components of the coastal management program with respect to those purposes.

1. Does the activity involve the harvest or processing of timber? **No**

## **6 AAC 80.110 MINING AND MINERAL PROCESSING**

1. Mining and mineral processing in the coastal area must be regulated, designed, and conducted so as to be compatible with the ACMP standards contained in this questionnaire, adjacent uses and activities, statewide and national needs, and district programs.

### **Evaluation**

**No mining or mineral processing would be conducted as part of the GMD program.**

2. Sand and gravel resources may be extracted from coastal waters, intertidal areas, barrier islands, and spits, when there is no feasible and prudent alternative to coastal extraction which will meet the public need for the sand or gravel.

### **Evaluation**

**No sand or gravel resources would be obtained from coastal waters, intertidal areas, barrier islands, and spits.**

## **6 AAC 80.120 SUBSISTENCE**

Districts and state agencies shall recognize and assure opportunities for subsistence usage of coastal areas and resources. Districts may designate areas as subsistence zones in which subsistence uses and activities have priority over all nonsubsistence uses and activities.

### **Evaluation**

**Eareckson AS is exempt from subsistence uses because of restricted access.**

## **6 AAC 80.130 HABITATS**

The following habitats must be managed so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat which contribute to its capacity to support living resources:

- (1) offshore areas;
- (2) estuaries;
- (3) wetlands and tideflats;
- (4) rocky island and seacliffs;
- (5) barrier islands and lagoons;
- (6) exposed high energy coast;
- (7) rivers, streams, and lakes; and
- (8) important upland habitat.

The following standards must be considered if the project impacts any of the habitats listed above:

1. Offshore areas must be managed as fisheries conservation zone so as to try to maintain or enhance the state's sport, commercial, and subsistence fishery.

### **Evaluation**

**The proposed project would not affect fisheries conservation zones or affect the state's sport, commercial, and subsistence fishery.**

2. Estuaries must be managed so as to assure adequate water flow, natural circulation patterns, nutrients, and oxygen levels, and avoid the discharge of toxic wastes, silt, and destruction of productive habitat.

### **Evaluation**

**No estuaries would be affected by the GMD VOC Test Bed program activities on Shemya Island.**

3. Wetlands and tideflats must be managed so as to assure adequate water flow, nutrients, and oxygen levels and avoid adverse effects on natural drainage patterns, destruction of important habitat, and discharge of toxic substances.

### **Evaluation**

**Construction of the GMD VOC Test Bed system will affect 17.44 acres of wetlands on the interior part of the island. Since most of the interior portion of the island consists of wetlands, avoidance is not possible. The Corps of Engineers and State of Alaska would be consulted and the necessary 401 and 404 permits obtained. During the permit process the appropriate mitigation measures would be developed.**

The USFWS has indicated that restoration of habitat on the island is not appropriate because of potential bird aircraft strike hazard and the previous ground disturbance of the island.

4. Rocky islands and seacliffs must be managed so as to avoid the harassment of wildlife, destruction of important habitat, and the introduction of competing or destructive species and predators.

#### Evaluation

There would be no construction or operation activities on rocky islands or seacliffs. General construction activities would occur well inland from the coastline and would result in no impact to marine species. GMD will avoid the introduction of any alien species to Shemya Island.

5. Barrier islands and lagoons must be managed so as to maintain adequate flows of sediments, detritus, and water, avoid the alteration or redirection of wave energy which would lead to the filling in of lagoons or the erosion of barrier islands, and discourage activities which would decrease the use of barrier island by coastal species including polar bears and nesting birds.

#### Evaluation

No barrier islands or lagoons would be impacted by GMD activities on Shemya Island.

6. High-energy coast must be managed by assuring the adequate mix and transportation of sediments and nutrients and avoiding redirection of transport processes and wave energy.

#### Evaluation

No activities would take place on a high-energy coast that would change the adequate mix and transportation of sediments and nutrients.

7. Rivers, streams, and lakes must be managed to protect natural vegetation, water quality, important fish or wildlife habitat and natural water flow.

#### Evaluation

GMD activities on Shemya Island would not affect any rivers, streams, or lakes. Appropriate measures would be taken to limit site soil erosion.

8. Activities and uses in the coastal upland habitats that significantly affect the above noted habitats, including upland habitats, are subject to the program. These habitats must be managed to maintain or enhance the biological, physical, and chemical characteristics of the habitat, which contribute to its capacity to support living resources.

### Evaluation

The upland areas proposed for construction on Shemya Island have been previously disturbed. Potential construction of the GMD VOC Test Bed would affect 7 hectares (17.44 acres) of wetlands. Since most of the island contains wetlands, impacts are unavoidable. In addition, the USFWS has indicated that there is no appropriate area on Shemya to mitigate potential impacts to wetlands.

## **6 AAC 80.140 AIR, LAND, AND WATER QUALITY**

Notwithstanding any other provisions of 6 ACC 80, the statutes pertaining to and the regulations and procedures of the Alaska Department of Environmental Conservation (DEC) with respect to the protection of air, land, and water quality are incorporated into the ACMP and, as administered by that agency, constitute the components of the coastal management program with respect to those purposes.

1. Does the project comply with DEC air quality standards? **Yes, all necessary permits will be obtained.**
2. Does the project comply with DEC water quality standards? **Yes, all necessary permits will be obtained.**
3. Does the project comply with DEC land quality standards? **Yes, all necessary permits will be obtained.**

## **6 AAC 80.150 HISTORICAL, PREHISTORIC, AND ARCHAEOLOGICAL RESOURCES**

Districts and appropriate state agencies shall identify areas of the coast which are important to the study, understanding, or illustration of national, state, or local prehistory.

1. Does the project involve disturbance, investigation, or removal of known historical or archaeological resources? **No historical or archaeological resources would be impacted from GMD construction or operation (clearance letter received from State Historic Preservation Office).**

## **OTHER STANDARDS**

The following standards may need to be considered depending on the type of activity that is proposed and its location:

## **6 ACC 80.070 ENERGY FACILITIES**

Districts identify sites suitable for development of energy facilities.

### **Evaluation**

No public energy facilities would be constructed as part of the GMD VOC Test Bed program at Eareckson Air Station. The existing power plant will undergo modification and refurbishment.

## **6 AAC 80.090 FISH AND SEAFOOD**

Districts may designate coastal areas suitable for development of facilities related to commercial fishing and seafood processing.

### **Evaluation**

Construction would occur on Shemya Island and would not impact any areas suitable for development of commercial or seafood processing.

## **CONSISTENCY DETERMINATION**

Based on the analysis of the previous section and any other relevant factors, is the activity consistent to the maximum extent practicable with the ACMP (including district policies)?

**Yes.**

Consistency Determination:

The GMD Program Office determines that the proposed activity complies with, and will be conducted in a manner consistent to the maximum extent practicable with, the Alaska Coastal Management Program, including affected coastal district programs.

\_\_\_\_\_  
Signature of Agency Representative/Position

\_\_\_\_\_  
Date

## **APPENDIX B**

### **ALEUTIANS WEST COASTAL RESOURCE SERVICE AREA COASTAL MANAGEMENT PROGRAM ENFORCEABLE AND ADMINISTRATIVE POLICIES**

#### **A-1 Water Dependent and Water-Related Activities**

All GMD VOC Test Bed activities would occur on the inland parts of the island. Materials will be brought in by barge and off loaded at the existing barge landing area and/or dock.

#### **A-2 Mitigation**

No impacts are expected for commercial fishing uses and activities, subsistence and personal use resources, or recreational resources. Consultation is ongoing with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers about appropriate mitigations for the potential destruction of some wetlands and habitat on Shemya Island. Potential GMD VOC Test Bed construction could affect 7 hectares (17.44 acres) of wetlands. Since most of the island contains wetlands, impacts are unavoidable. In addition, the USFWS has indicated that there is no appropriate area on Shemya to mitigate potential impacts to wetlands. During the permitting process the appropriate wetlands mitigation measures would be developed. No historic properties will be affected, but if unexpected discoveries are made the project will stop and the State Historic Preservation Officer (SHPO) consulted. Appropriate air and water quality permits will be obtained.

#### **A-3 Multiple Use**

The GMD VOC Test Bed project will utilize existing facilities and minimize the construction of new facilities where applicable.

#### **A-4 Compatibility**

Shemya Island is the only inhabited island in the area and is currently used as a military base, thus the associated GMD activities will be compatible with the existing and surrounding uses. The island is located in the Alaska Maritime National Wildlife Refuge. There is a Memorandum of Understanding between the U.S. Fish and Wildlife Service and the Air Force that authorizes the Air Force to control, operate and maintain air navigation, installation-related facilities, and other defense-related facilities situated on Shemya Island in the interests of national defense and for the benefit of private, commercial, and government aircraft.

#### **A-5 Dredge and Fill Requirements**

17.44 acres of wetland could be filled by construction of GMD VOC Test Bed elements. This will also be conducted in compliance with State and Federal regulations. These areas will be avoided to the extent possible and consultation with USFWS and the U.S. Army Corps of Engineers is ongoing to develop appropriate mitigation measures.

#### **A-6 Disposal of Dredge Spoil**

No dredging is anticipated, however, there would be a large amount of peat and/or overburden material generated from site preparation that is unsuitable for construction and would require disposal. Preferred uses for this overburden material are to use it as cover for landfills and abandoned roads. This will be closely coordinated with the Eareckson AS Program Manager.

#### **A-7 Navigation Obstructions**

No navigation obstructions are anticipated from GMD program activities on Shemya Island.

#### **A-8 Floating Facilities**

No floating facilities are anticipated for GMD Program activities on Shemya Island.

#### **A-9 Monitoring and Compliance Enforcement**

The GMD program will establish a mitigation monitoring program prior to the start of construction activities. This plan will stipulate the necessary compliance enforcement.

#### **A-10 Monitoring Priorities [Administrative Policy]**

Administrative Policy noted.

#### **A-11 Coordination with Municipal Regulations [Administrative Policy]**

Not applicable to the GMD program.

#### **A-12 Optimum Location of Development [Administrative Policy]**

Not applicable to the GMD program.

#### **A-13 Large Scale Land Development and Subdivision [Administrative Policy]**

The GMD program prepared an EIS that addressed potential impacts to fish and wildlife resource and habitat concerns, personal use and subsistence resources uses

and access, and surface drainage and water quality concerns. Additional information can be found in the NMD Deployment EIS dated July 2000.

#### **A-14 Public Notice and Involvement Opportunities [Administrative Policy]**

Eareckson AS is restricted to the public, however there will be several opportunities for public involvement during planning and permitting. The wetlands permit application will be available for public review and comment during the month of February 2002. The GMD Validation of Operational Concept EA will be available for public review during the month of March 2002.

#### **A-15 Unalaska Harbor Management Plan [Administrative Policy]**

The GMD program activities will have no impacts on Unalaska.

### **B. Habitat**

#### **B-1 State Standards**

See evaluation of the Alaska Coastal Management Standards for the Ground-based Midcourse Defense Program Activities on Shemya Island.

#### **B-2 Upland Habitats**

Measures will be implemented during construction to avoid excessive runoff and erosion. This in turn should help maintain the current water quality, drainage patterns and not affect groundwater recharge areas. Disturbance to vegetation will be minimized to the extent practicable. The upland areas proposed for construction on Shemya Island have been previously disturbed.

#### **B-3 Anadromous Fish Waters**

No anadromous fish waters occur on Shemya Island, thus no impacts are expected from GMD program activities.

#### **B-4 Maintenance of Fish Passage and Stream Characteristics**

No anadromous fish waters occur on Shemya Island, thus no impacts are expected from GMD program activities.

#### **B-5 Instream Flow**

No anadromous fish waters occur on Shemya Island, thus no impacts are expected from GMD program activities.

#### **B-6 Water Removal from Fish Streams**

No anadromous fish waters occur on Shemya Island, thus no impacts are expected from GMD program activities.

## **B-7 Geophysical Surveys**

Surveys have been conducted on Eareckson AS; however, the activities are inland and do not impact fish and wildlife populations or habitat. Shemya Island is in seismic zone 4 and is subject to a high probability of severe earthquake ground shaking during the life of GMD elements. The IFICS Data Terminal and DSCS would be designed and constructed taking into account seismic and wind conditions found on Shemya Island.

## **B-8 Raptor Nest Sites**

GMD activities on Shemya Island would not harm or disturb any raptor nest sites.

## **B-9 Marine Mammal Haul-outs and Seabird Colonies**

There would be no construction or operation activities near any marine mammal haul-outs and seabird colonies. General construction activities would occur well inland from the coastline and would result in no impact to marine species.

## **B-10 Threatened and Endangered Species**

The Aleutian Canada goose was recently delisted from a threatened species to a recovered one that requires monitoring for the next 5 years. The goose is found on the island from mid April through mid June and mid August through mid October for non-breeding activities, such as staging, resting, and feeding during migration. Feeding occurs over the entire island primarily during daylight hours as the geese return to neighboring predator free islands for the night. The geese do not nest on Shemya Island, and the island is not suitable for nesting recovery efforts due to the presence of humans, rodents, and blue phase arctic fox. (U.S. Fish and Wildlife Service, 2001) Vegetation studies are being conducted by the Air Force along with the USFWS to assist in a bird aircraft strike hazard assessment. The purpose of the assessment is to minimize the potential safety hazard to aircraft from a bird strike during flight operations on Eareckson AS. The USFWS is allowing the Air Force to maintain vegetation on the island to minimize use by the Aleutian Canada goose. GMD related construction activities including equipment noise and limited blasting of quarry material and resulting new facilities could affect feeding and resting areas on the island.

The short-tailed albatross is officially listed as a proposed candidate species in Alaska (endangered only on the high seas and in Japan and Russia). Most summer sightings of this albatross are in the Aleutian Islands, Bering Sea, and Gulf of Alaska. Its presence on Shemya Island is considered unlikely. This species has been proposed for listing for the near-shore areas, 5 kilometers (3 miles) out from U.S. shores to correct an administrative oversight.

The threatened spectacled eider may be observed offshore during the winter. The only known regularly occupied nesting area of the Steller's eider in Alaska is now

near Barrow. This eider species may occur in intertidal waters of Shemya Island during the winter.

#### **B-11 Bank Stabilization**

Erosion control techniques and stabilization measures will be implemented to prevent erosion and sedimentation into adjoining waters during construction and operation.

#### **B-12 Disturbance by Aircraft [Administrative Policy]**

Not applicable to the GMD program. The GMD Program would use existing runway and flight patterns currently used by the Air Force.

#### **B-13 Update of Resource Information [Administrative Policy]**

Not applicable to the GMD program.

### **C. Air, Land, and Water Quality**

#### **C-1 State Standards**

See evaluation of the Alaska Coastal Management Standards for the Ground-based Midcourse Defense Program Activities on Shemya Island.

#### **C-2 Maintain Water Quality Criteria**

Best Management Practices and erosion control techniques will be implemented during GMD construction in order to maintain the water quality status. All necessary permits will be obtained for construction and operation.

#### **C-3 Wastewater Discharge**

The additional wastewater created by GMD construction and operations can be easily accommodated by the existing system on Eareckson AS. The system has an existing NPDES discharge permit, that will be updated to include GMD VOC Test Bed operations. Any additional permits required would be obtained before construction begins.

#### **C-4 Shoreline Developments**

No development would occur along the shoreline.

#### **C-5 Environmental Protection Technology**

GMD program activities will use the latest technology to the extent feasible and prudent in efforts to reduce impacts to the environment.

## **C-6 Hazardous Substances**

Storage, transportation, cleanup, and disposal of hazardous materials and waste will comply with Federal, state and local laws and regulations. Appropriate plans will be put in place before construction of GMD elements occur on Eareckson AS.

## **C-7 Siltation and Sedimentation**

Erosion control techniques and stabilization measures will be implemented to prevent erosion and sedimentation into adjoining waters during construction and operation. In addition, all appropriate water quality permits will be obtained.

## **C-8 Refuse Disposal**

Current estimates expect the landfill on Eareckson AS to reach capacity in less than 15 years. GMD construction at the base would reduce the landfill's life expectancy; however, there is room for the landfill to expand, if necessary.

## **C-9 Sewage Disposal**

The additional sewage created by GMD construction and operations can be easily accommodated by the existing system on Eareckson AS. The system has an existing NPDES discharge permit, that will be updated to include GMD Test Bed operations. Any additional permits required would be obtained before construction begins.

## **C-10 Storage of Petroleum and Petroleum Products**

All storage facilities would comply with the requirements of this policy.

## **C-11 Spill Containment and Cleanup Equipment**

The GMD program would follow existing procedures on Eareckson AS regarding spill containment and cleanup. In addition, a Contaminated Media Workplan has been developed for GMD construction activities.

## **C-12 Cumulative Impacts on Air Quality**

All necessary air quality permits will be obtained prior to construction and operation of the GMD elements. No other air pollutant sources have been identified in the surrounding area.

## **C-13 Cumulative Impacts on Water Quality**

Best Management Practices and erosion control techniques will be implemented during GMD construction in order to maintain the water quality status. All necessary water quality permits will be obtained for construction and operation.

## **C-14 Planning for Cumulative Impacts [Administrative Policy]**

No cumulative impacts to water quality or air quality are anticipated from GMD activities.

#### **C-15 Planning and Coordination [Administrative Policy]**

The GMD program will make use of existing management plans on Eareckson AS regarding the use of hazardous substances.

#### **C-16 Siting of Facilities [Administrative Policy]**

The GMD facilities would be sited within an existing military facility to maximize system performance.

#### **C-17 Oil Spill Contingency Plans [Administrative Policy]**

Existing installation plans will be amended taking into account GMD facilities.

#### **C-18 Monitoring and Compliance [Administrative Policy]**

The Department of Environmental Conservation will be consulted regarding GMD VOC Test Bed program activities and any monitoring requirements.

### **D. Subsistence**

#### **D-1 State Standards**

The construction and operation of GMD elements on Eareckson AS will have no effect on subsistence, since access to the island is restricted to site-related personnel and no hunting is allowed. In addition, construction of the GMD system would not affect any subsistence uses or subsistence resources in the water surrounding the island.

#### **D-2 Development Impacts**

The GMD project at Eareckson AS is not in an area traditionally used for subsistence, since access to the island is restricted to site-related personnel and no hunting is allowed.

#### **D-3 Access**

Access to Eareckson AS is restricted to site-related personnel and no hunting is allowed. In addition, construction of the GMD system would not affect any subsistence uses or subsistence resources in the water surrounding the island.

#### **D-4 Planning Processes [Administrative Policy]**

No significant adverse impacts on subsistence are anticipated since access to the island is restricted to site-related personnel and no hunting is allowed. In addition,

construction of the GMD system would not affect any subsistence uses or subsistence resources in the water surrounding the island.

#### **D-5 Subsistence Resource Management [Administrative Policy]**

No impacts to subsistence resources would occur as a result of GMD activities.

#### **E-1 Stream Crossings**

No anadromous fish waters occur on Shemya Island, thus no impacts are expected from GMD program activities.

#### **E-2 Maintaining Traditional Public Access**

Access to Shemya Island is restricted to site-related personnel.

#### **E-3 Off-Road Access**

Access to Shemya Island is restricted to site-related personnel; therefore, there will be no off-road access.

#### **E-4 Shoreline Setback**

All GMD VOC Test Bed activities would occur on the inland parts of the island. Materials will be brought in by barge and off loaded at the existing barge landing area and/or dock.

#### **E-5 Siting and Scheduling**

All utilities will follow the existing road and utility corridors to the maximum extent possible to minimize impacts.

#### **E-6 Planning Processes [Administrative Policy]**

Eareckson AS is restricted to the public, however the GMD Validation of Operational Concept EA will be available for public review during the month of March 2002.

#### **E-7 Unalaska Harbor Management Plan [Administrative Policy]**

The GMD program activities will have no impacts on Unalaska.

#### **E-8 Regional Solid Waste Facility [Administrative Policy]**

GMD program activities will not involve the design or construction of a regional marine waste disposal facility.

### **F. Fisheries and Seafood Processing**

#### **F-1 Optimum Resource Use**

GMD program activities on Eareckson AS will not affect important fish habitat, fish migration routes, or the recreational or commercial harvest of fish.

## **F-2 Development**

GMD program activities on Eareckson AS will not have any adverse impacts on fisheries resources, recreational fishing, enhancement projects, subsistence or personal use fishing, or commercial fishing.

## **F-3 Disposal of Seafood Processing Wastes**

GMD program activities on Eareckson AS will not deal with seafood processing and therefore will have no seafood processing waste.

## **F-4 Utilization of Seafood Processing Waste [Administration Policy]**

GMD program activities on Eareckson AS will not deal with seafood processing and therefore will have no seafood processing waste.

## **F-5 Notification of Hazards to Commercial Fisherman [Administrative Policy]**

GMD program activities on Eareckson AS will not impact the surrounding marine waters.

## **F-6 Preferred Sites for Seafood Processing [Administrative Policy]**

GMD program activities on Eareckson AS does not involve a seafood processing site.

## **F-7 Fisheries Enhancement and Habitat Improvement [Administrative Policy]**

The GMD program would have no impact on fisheries; thus, no habitat improvement would be required.

## **F-8 Expanded Commercial Fisheries and Mariculture [Administrative Policy]**

Not applicable to the GMD program.

## **F-9 Commercial Fishing Industry Development [Administrative Policy]**

Not applicable to the GMD program.

## **G. Geophysical Hazard Areas**

### **G-1 Design and Siting Criteria**

The GMD VOC Test Bed program elements would be designed and constructed taking into account seismic and wind conditions found on Shemya Island.

## **G-2 Coastal Processes**

Erosion control techniques and stabilization measures will be implemented to prevent erosion and sedimentation into adjoining waters during construction and operation.

## **G-3 Stream Flooding**

No GMD VOC Test Bed elements will be located within the 100-year floodplain.

## **G-4 Erosion**

Erosion control techniques and stabilization measures will be implemented to prevent erosion and sedimentation into adjoining waters during construction and operation. Disturbance to vegetation will be minimized to the extent practicable. The upland areas proposed for construction on Shemya Island have been previously disturbed.

## **G-5 Seismic Hazards [Administrative Policy]**

Construction of new facilities would incorporate seismic design parameters consistent with the critical nature of the facilities and geologic setting.

## **G-6 Emergency Response Program [Administrative Policy]**

Appropriate plans will be developed with applicable agencies to plan response actions in the event of a major seismic event at Eareckson AS.

## **H. Recreation**

### **H-1 Protection of Recreation Values**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD VOC Test Bed system would not impact any areas in which public recreation would occur.

### **H-2 Conflict Mitigation**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD system would not impact any areas in which public recreation would occur.

### **H-3 Open Space Areas [Administrative Policy]**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD system would not impact any areas in which public recreation would occur.

### **H-4 Easements and Rights of Way [Administrative Policy]**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD system would not impact any areas in which public recreation would occur.

### **H-5 Planning Processes [Administrative Policy]**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD system would not impact any areas in which public recreation would occur.

### **H-6 Community Recreation Plans [Administration Policy]**

Eareckson AS has restricted access to mission-related personnel; no public recreation or tourism is currently permitted. Construction of the GMD system would not impact any areas in which public recreation would occur.

## **I. Historical and Archeological Areas**

### **I-1 Cultural and Historic Resource Areas**

No historic or archaeological resources would be impacted from GMD construction or operation (clearance letter received from State Historic Preservation Office). However, if during the course of GMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO notified.

## **I-2 Resource Protection**

No historic or archaeological resources would be impacted from GMD construction or operation. All efforts will be made to avoid the known existing cultural sites. However, if during the course of GMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO notified.

## **I-3 Removal of Artifacts [Administration Policy]**

No archaeological or historic artifacts will be removed.

## **I-4 Data Requirements [Administration Policy]**

No archaeological projects are planned for the GMD program at Eareckson AS.

## **I-5 Cultural Resource Planning [Administration Policy]**

No archaeological projects are planned for the GMD program at Eareckson AS.

## **J. Energy Facilities**

### **J-1 State Standards**

No public energy facilities would be constructed as part of the GMD program.

### **J-2 Oil and Gas Development**

No public energy facilities would be constructed as part of the GMD program.

### **J-3 Alternative Energy Resources [Administrative Policy]**

No alternative energy resources would be constructed as part of the GMD program.

### **J-4 Oil and Gas Storage and Trans-shipment Facilities [Administrative Policy]**

Storage tanks proposed for the GMD elements at Eareckson AS would contain fuel for the electrical generators. All are aboveground and consist of one 2.35 million gal. tank, two 4,000 gal. tanks, two 400 gal. tanks, and one 1,050 gal. tank. All storage tanks installed for the GMD program would be coordinated and comply with appropriate state and Federal agencies.

## **K. Mining**

### **K-1 Siting of Material Sources**

No mining or mineral process would be conducted as part of the GMD program.

### **K-2 In-stream Mining**

No mining or mineral process would be conducted as part of the GMD program.

### **K-3 Best Management Practices**

No mining or mineral process would be conducted as part of the GMD program.

### **K-4 Mining in Fish Habitat**

No mining or mineral process would be conducted as part of the GMD program.

### **K-5 Overburden Disposal**

No mining or mineral process would be conducted as part of the GMD program.

### **K-6 Reclamation and Restoration**

No mining or mineral process would be conducted as part of the GMD program.

### **K-7 Restoration Cost Guarantees [Administration Policy]**

No mining or mineral process would be conducted as part of the GMD program.

### **K-8 Siting of Material Sources [Administration Policy]**

No mining or mineral process would be conducted as part of the GMD program.

### **K-9 Siting of Mineral Extraction Projects [Administration Policy]**

No mining or mineral process would be conducted as part of the GMD program.